

REPORT
OF THE
HEALTH DEPARTMENT
OF
THE PANAMA CANAL
FOR THE
CALENDAR YEAR
1920

H. C. FISHER

Colonel, Medical Corps, United States Army
Chief Health Officer

Gift of the Panama Canal Museum

THE PANAMA CANAL PRESS
MOUNT HOPE, C. Z.
1921

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THE PANAMA CANAL.
HEALTH DEPARTMENT.

Operating under the direction of the Governor of The Panama Canal. Maintained from funds designated for sanitation in Panama Canal appropriations and revenues derived from its own operations. It exercises jurisdiction in health matters over the Canal Zone and the cities of Panama and Colon, Republic of Panama, and also cooperates with the Panaman Government in health matters in other parts of the Republic.

LETTER OF TRANSMITTAL.

THE PANAMA CANAL,
HEALTH DEPARTMENT,
BALBOA HEIGHTS, C. Z., March 17, 1921.

Col. JAY J. MORROW,
*Governor, The Panama Canal,
Balboa Heights, Canal Zone.*

SIR: I have the honor to submit the following report of the operations of the health department for the year 1920.

Respectfully,

H. C. FISHER,
Chief Health Officer.

HEALTH DEPARTMENT.

ORGANIZATION AND OPERATION.

The organization of the health department consists of:

Chief Health Office, Balboa Heights:

Division of Hospitals and Charities—

Ancon Hospital, Ancon.

Colon Hospital, Colon.

Corozal Hospital, Corozal.

Santo Tomas Hospital, Panama, R. P.

Palo Seco Leper Asylum, Palo Seco.

Dispensaries at—

Colon Hospital.

Gatun.

Pedro Miguel.

Ancon Hospital.

Balboa.

District Dentists at—

Colon.

Gatun.

Pedro Miguel.

Ancon.

Balboa.

La Boca.

Medical Storehouse, Ancon.

Division of Sanitation—

Health Office, Panama.

Health Office, Colon.

Chief Sanitary Inspector, Canal Zone, Balboa Heights—

District Sanitary Inspectors at—

Gatun.

Pedro Miguel.

Ancon.

Balboa.

Division of Quarantine—

Chief Quarantine Office, Balboa Heights.

Quarantine Station, Colon.

Quarantine Station, Fort Amador.

Quarantine Station, Bocas del Toró.

PERSONNEL.

(December 31, 1920.)

Chief Health Office.

Balboa Heights.

Col. H. C. Fisher, U. S. Army, Chief Health Officer.
 Dr. D. P. Curry, Assistant Chief Health Officer.

DIVISION OF HOSPITALS AND CHARITIES.

Ancon Hospital.

Col. L. T. Hess, U. S. Army, Superintendent.
 Dr. T. W. Earhart, Chief of Surgical Clinic.
 Dr. W. E. Hubbard, Assistant Chief of Surgical Clinic.
 Dr. R. C. Connor, Chief of Medical Clinic.
 Dr. W. W. Braithwaite, Assistant Chief of Medical Clinic.
 Dr. A. F. Ryan, Chief of Eye and Ear Clinic.
 Dr. T. H. Odineal, Assistant Chief of Eye and Ear Clinic.
 Dr. L. S. Townsend, Chief of X-ray Clinic.

Physicians.

Dr. George Eugene.	Dr. C. D. Briscoe.
Dr. H. G. Hambleton.	Dr. H. K. Tuttle.
Dr. L. S. Chapman.	Dr. P. G. Pomeroy.
Dr. M. A. V. Smith.	Dr. James Burrow.
Dr. D. L. Hollis.	

Internes.

Dr. H. S. Liggett.	Dr. J. G. Stoelzle.
Dr. F. E. Hyde.	Dr. H. G. Campbell.
Dr. R. L. Ross.	

Board of Health Laboratory.

Dr. L. B. Bates, Chief of Laboratory.
 Dr. H. C. Clark, Pathologist.
 Capt. J. H. St. John, U. S. Army, Bacteriologist.
 Mr. J. E. Jacob, Chemist.
 Mr. L. H. Dunn, Entomologist.

*Corozal Hospital.*Dr. Louis Wender, *Superintendent.*

Physicians.

Dr. D. G. O'Neil.
 Dr. D. G. Sampson.

Colon Hospital.

Maj. T. J. Leary, U. S. Army, Superintendent.

Physicians.

Dr. W. V. Levy.
 Dr. W. W. Cook.
 Dr. J. C. Scott.
 Dr. J. S. Vance.

Internes.

Dr. F. R. Brunot.
 Dr. Wayne Gilder.

Santo Tomas Hospital (Panama).

Maj. E. A. Bocock, U. S. Army, Superintendent.

Physicians on Panama Canal Roll.

Dr. C. C. Phillips.
 Dr. N. B. Kupfer.

Palo Seco Leper Asylum.

Mr. F. D. Tucker, Superintendent.

Cristobal-Colon Dispensary.

Dr. W. V. Levy, District Physician.

Gatun Dispensary.

Dr. J. A. Grider, District Physician.

Pedro Miguel Dispensary.

Dr. W. B. Meares, District Physician.

Balboa Dispensary.

Dr. I. E. Hix, District Physician.
 Dr. L. O. Keen.
 Dr. R. L. Harvey.
 Dr. J. R. Ernst.

Ancon Dispensary.

Dr. W. K. Olson, District Physician.
 Dr. H. G. Bickford.

DIVISION OF SANITATION.

Panama Health Office.

Dr. Henry Goldthwaite, Health Officer.

J. M. Carpprow, Sanitary Inspector.
 C. L. Pierce, Sanitary Inspector.
 N. C. Anderson, Sanitary Inspector.
 O. W. Searcy, Sanitary Inspector.
 B. C. Quinby, Building Inspector.
 H. A. Lewis, Vaccinator.
 Dr. F. T. Eisenman, Veterinarian and Meat Inspector.
 Dr. H. L. Casey, Veterinarian and Meat Inspector.

Colon Health Office.

Dr. J. L. Byrd, Health Officer.

C. H. Bath, Sanitary Inspector.
 T. A. Leathley, Sanitary Inspector.
 M. M. Seeley, Sanitary Inspector.
 E. K. Turner, Sanitary Inspector.
 Geo. Campbell, Sanitary Inspector.
 W. S. Chidester, Sanitary Inspector.
 Emil Becker, Sanitary Inspector.
 Dr. I. C. Mattatall, Supervising Veterinarian and Meat Inspector.
 Dr. W. F. Gross, Veterinarian and Meat Inspector.
 Dr. F. F. Dowd, Veterinarian and Meat Inspector.

Canal Zone Sanitation.

E. F. Quimby, Sanitary Inspector, Gatun District.
 I. W. Pickett, Sanitary Inspector, Pedro Miguel District.
 Geo. L. Willett, Sanitary Inspector, Ancon-Corozal District.
 John P. Corrigan, Sanitary Inspector, Balboa District.
 J. L. Tolar, Sanitary Inspector (Relief).

DIVISION OF QUARANTINE.

Chief Quarantine Office.

Balboa Heights.

Surgeon W. C. Rucker, U. S. P. H. S., Chief Quarantine Officer.

Cristobal-Colon Quarantine, Cristobal, C. Z.

Dr. C. A. Hearne, Quarantine Officer.
 Dr. E. T. Lake.
 Dr. E. W. Torrey.
 Dr. P. Horwitz.

Balboa-Panama Quarantine, Fort Amador, C. Z.

Dr. J. D. Odom, Quarantine Officer.
 Dr. J. C. Hubbard.

Bocas del Toro (R. P.) Quarantine.

Dr. W. J. Burke, Quarantine Officer.

VITAL STATISTICS.

EMPLOYEES.

The average number of employees on the rolls of The Panama Canal and the Panama Railroad, for the year was 20,673, as compared with 24,204 for 1919, and 25,520 for 1918.

The total admission rates to hospitals and quarters was 671.84, as compared with 550.21 in 1919, and 405.67 for 1918. For disease alone the admission rate to hospitals was 183.91, as compared with 176.09 in 1919, and 136.60 in 1918. The total admission rate to hospitals only was 221.35, as compared with 210.92 in 1919, and 163.17 in 1918. (*See Chart No. 1.*)

The total death rate was 8.70, as compared with 7.23 in 1919, 8.11 in 1918, 7.09 in 1917, 6.03 in 1916, 5.77 in 1915, and 7.04 in 1914. The death rate from disease alone was 7.40 as compared with 6.20 in 1919, and 7.13 in 1918. (*See Chart No. 2.*)

The constantly noneffective rate from all causes was 14.87, as compared with 14.29 in 1919, and 11.02 in 1918. (*See Chart No. 3.*)

The admission rate for malaria, to both hospitals and quarters, was 19.40, as compared with 31.07 for 1919, and 18.55 for 1918. The noneffective rate for malaria was 0.45, as compared with 0.99 for 1919, and 1.13 for 1918. (*See Charts 4, 5, and 6.*)

The admission rate for typhoid fever was 0.24, as compared with 0.17 for 1919, and 0.24 for 1918. Three deaths from typhoid fever among employees occurred during the year.

The five diseases causing the highest number of hospital admissions with their rates, were as follows:

	1919.		1920.	
	Admissions.	Rate.	Admissions.	Rate.
Influenza	305	12.60	621	30.04
Venereal diseases	540	22.31	552	26.70
Malaria	678	28.01	401	19.40
Diseases of the eyes and their annexa	194	8.02	152	7.35
Tuberculosis (various organs)	81	3.34	82	3.97

The five diseases causing the highest number of deaths, with their rates, were as follows:

	1919.		1920.	
	Deaths.	Rate.	Deaths.	Rate.
Tuberculosis (various organs)	23	0.95	30	1.45
Pneumonia (broncho and lobar)	19	.78	22	1.06
Influenza	1	.04	21	1.02
Nephritis (acute and chronic)	21	.87	13	.63
Organic diseases of the heart	18	.74	11	.53

* All rates given are computed as equivalent annual per 1,000.

EFFECTS OF RACE.

The admission rate to hospitals and death rate from disease, for white employees, were 267.06 and 3.63 respectively, as compared with 159.53 and 8.51 for black employees.

The admission rate to hospitals and quarters for malaria was 20.05 for white employees, as compared with 19.21 for black employees.

The death rate from disease for Americans was 3.32, as compared with 1.08 for 1919, and 3.38 in 1918.

CANAL ZONE.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 27,469 in the Canal Zone, there was a total of 242 deaths during the year. Of these, 211 deaths were from disease, giving a rate of 7.68 as compared with 7.81 for 1919, and 9.69 for 1918.

The death rate from tuberculosis was 1.02, as compared with 0.83 for the preceding year, and 1.84 for 1918. Tuberculosis caused 13 per cent of all deaths from disease during the year.

There were 631 live births reported during the year, giving a birth rate of 22.98. (See Table VII.) Of these 231 were white, and 400 were black. Of the total births reported, 5 per cent were stillbirths.

Deaths among children, under 1 year of age, from all causes, totaled 60, of which 8 were white, and 52 black; giving an infant mortality rate, based on the number of births reported for the year, of 34.36 for white, and 130 for black children, with a general average of 95.09 per 1,000 births.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 38 per cent among children under 5 years of age.

Below is a table showing the death rates for the Canal Zone from 1905 to 1920, inclusive, from all causes among both employees and nonemployees:

Year.	Popu- lation.	Deaths.	Rate per 1,000.	Year.	Popu- lation.	Deaths.	Rate per 1,000.
1905.....	23,463	828	35.29	1913.....	61,700	1,047	16.97
1906.....	34,095	1,700	49.86	1914.....	46,379	710	15.31
1907.....	54,036	1,708	31.60	1915.....	31,946	410	12.83
1908.....	67,146	1,273	18.95	1916.....	31,447	343	10.91
1909.....	76,900	1,025	13.33	1917.....	² 27,543	313	11.36
1910.....	86,465	1,251	14.47	1918.....	² 22,290	236	10.59
1911.....	90,434	1,385	15.32	1919.....	² 26,511	229	8.64
1912.....	79,279	1,129	14.24	1920.....	27,469	242	8.81

² Average population, excluding military population for last 6 months of 1917, the year 1918. and the first 6 months of 1919.

PANAMA CITY.

EMPLOYEES AND NONEMPLOYEES.

From a population of 60,500, based on a census taken this year by the Panamanian Government, there was a total of 1,297 deaths

during the year. Of these, 1,246 were from disease, giving a rate of 20.60, as compared with 18.98 for 1919, and 20.92 for 1918.

The principal causes of deaths as compared with the preceding year, were as follows:

	Deaths in—	
	1919.	1920.
Tuberculosis (various organs).....	241	206
Diarrhea and enteritis (including colitis).....	152	175
Pneumonia (broncho and lobar).....	171	167
Nephritis (acute and chronic).....	84	77
Premature birth.....	25	47
Cancer (various organs).....	35	46

The death rate from tuberculosis was 3.40, as compared with 3.93 for 1919, and 4.14 for 1918. Tuberculosis caused approximately 16 per cent of all deaths from disease during the year, as compared with 20 per cent for the preceding year, and 19 per cent for 1918.

There were 2,376 live births reported during the year, giving a birth rate of 41.55. Of the total births reported, 6 per cent were stillbirths.

There were 369 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported during the year, of 155.30.

Of the total deaths, 28 per cent occurred among children under 1 year of age, and 40 per cent among children under 5 years of age.

Below is a table showing the death rate in Panama City from 1905 to 1920, inclusive, from all causes among both employees and non-employees.

Year.	Popula- tion.	Deaths.	Rate per 1,000.	Year.	Popula- tion.	Deaths.	Rate per 1,000.
1905.....	21,984	1,447	65.82	1913.....	47,172	1,507	31.95
1906.....	25,518	1,142	44.75	1914.....	53,948	1,863	34.53
1907.....	33,548	1,156	34.45	1915.....	60,373	1,810	29.98
1908.....	37,073	1,292	34.83	1916.....	60,778	1,765	29.04
1909.....	40,801	1,038	25.44	1917.....	61,074	1,714	28.06
1910.....	45,591	1,446	31.72	1918.....	61,369	1,314	21.41
1911.....	46,555	1,456	31.27	1919.....	61,369	1,211	19.74
1912.....	47,057	1,380	29.33	1920.....	60,500	1,297	21.44

COLON.

EMPLOYEES AND NONEMPLOYEES.

From an estimated population of 26,078, a total of 554 deaths occurred during the year. Of these, 517 were from disease, giving a rate of 19.82, as compared with 20.55 for the preceding year, and 22.51 for 1918.

The principal causes of death, as compared with last year, follow:

	1919.	1920.
Tuberculosis (various organs).....	101	109
Diarrhea and enteritis (including colitis).....	55	49
Nephritis (acute and chronic).....	56	45
Bronchitis (acute and chronic).....	38	37
Pneumonia (lobar and broncho).....	74	36
Organic diseases of the heart.....	46	28

The death rate from tuberculosis was 4.18, as compared with 3.87 for the preceding year, and 4.45 for 1918. Of the total deaths from disease, tuberculosis caused 21 per cent.

There were 962 live births reported during the year, giving a birth rate of 38.88. Of the total births reported, 5 per cent were stillbirths.

There were 137 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported during the year, of 142.41.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 35 per cent among children under 5 years of age.

Below is a table showing the death rate in Colon from 1905 to 1920, inclusive, from all causes among both employees and nonemployees:

Year.	Popula- tion.	Deaths.	Rate per 1,000.	Year.	Popula- tion.	Deaths.	Rate per 1,000.
1905.....	11,176	553	49.48	1913.....	20,232	489	24.17
1906.....	13,651	703	51.42	1914.....	23,265	590	25.36
1907.....	14,549	571	39.24	1915.....	29,331	640	21.82
1908.....	15,878	418	26.32	1916.....	24,693	696	28.19
1909.....	17,479	396	22.65	1917.....	25,386	667	26.27
1910.....	19,535	514	26.31	1918.....	26,078	616	23.62
1911.....	19,947	527	26.42	1919.....	26,078	573	21.97
1912.....	20,174	493	24.44	1920.....	26,074	554	21.24

GENERAL REMARKS.

Malaria.—The number of admissions for malaria to hospitals and quarters shows a gratifying decrease from that of the previous year.

COMPARATIVE STATEMENT OF TOTAL NUMBER OF MALARIA CASES REPORTED DURING THE CALENDAR YEARS 1919 AND 1920.

	Employees.		Nonemployees.		Total.	
	1919.	1920.	1919.	1920.	1919.	1920.
Canal Zone, sanitated areas.....	236	138	637	438	873	576
Canal Zone, cattle camps, etc.....	301	111	28	6	329	117
Canal Zone, miscellaneous unsanitated areas.....	21	18	47	17	68	35
Colon.....	70	20	69	21	139	41
Panama.....	62	30	119	70	181	100
Miscellaneous outside Zone (unsanitated).....	62	84	462	268	524	352
Total.....	752	401	1,326	820	2,114	1,221

The reduction in the total number of admissions is marked in every district, but more especially in those areas where the greatest effort and improvement have been made in sanitation. In the report for last year was noted the heavy infection at Colon and Cristobal, the cause being located in the large swamps that lie to the south and east of these cities. Direct flights of *Anopheles albimanus* and *tarsimaculata* were demonstrated to have occurred into the northern part of Colon from the Margarita Road swamp, over a distance of 2 miles, 1 mile of which was across the open water of Manzanillo Bay. The work of draining these swamps has been carried on steadily through the past year. The Army sanitary inspector has extended and elaborated his system of ditches in the Margarita Road swamps until this area is practically free from any extensive mosquito breeding places. Pastures lying within 1 mile of Mount Hope and the Cristobal dry dock were evacuated of their cattle and open drainage ditches installed.

The sanitary inspector of the Mount Hope district (Cristobal), having about completed the installation of earth ditches in most of his wet areas, has begun permanent construction by converting them into rock and tile drains where it is possible to do so, or by laying sectional half-round concrete bottoms where flat grades or absence of rock preclude the use of the covered tile. Not only has the malaria incidence shown a great decrease, but the capture of adult *anopheles* (a work carried on both as an index and as a valuable antimalarial measure) indicates that the sources of the great majority of these mosquitoes have been effectually controlled.

No new work has been done in the Gatun district, except for the change of the drains of a small area immediately adjacent to the west side of the locks from an open ditch system to rock and tile, and the filling of a small pond and a few unnecessary old ditches. The adult mosquito catch of the past wet season demonstrated that the draining (in 1919) of the large swamp west of the old French canal has abolished the chief source of the hordes of *anopheles* that annually had invaded this city. (See Report for 1919.)

The new Army camp at Fort Davis was completed and occupied in October. While the sanitation done by the Gatun district inspector affords a large degree of protection to this post, its situation north of Gatun, toward the low-lying swampy pastures of The Panama Canal dairy, will require much further extension of work in that direction in order to fully protect the camp.

The Pedro Miguel district is being further improved by conversion of open ditches in the adjacent former cattle pastures to rock-covered tile drains. The removal of the cattle from these pastures has greatly reduced the number of adult *anopheles* caught, and has also lessened the cost of control of these areas.

The Dredging Division, pumping from the canal prism spoil deposited there as a result of recent movements in the slide at Cucaracha, found it necessary to spill this material into the old Rio Grande valley opposite Paraiso. The heavier material was deposited satisfactorily, forming a porous fill that can be easily drained. The lighter material, however, was carried down the stream, to be deposited in the arm of Miraflores Lake adjacent to Pedro Miguel locks, converting much of this area into a shallow lagoon, barely covered by water, which, as vegetation becomes established, will

doubtless be converted into a troublesome and costly breeding place. The new channel of the Rio Grande (straightened and dug by the Health Department the previous year) was blocked, and the river once more became a shallow, widespread, meandering stream. Drainage ditches discharging into the stream were choked with silt, and this fine amorphous material completely filled the rock and tile band ditch at the foot of Paraiso hill, necessitating its removal. Thus was undone, in a few weeks, practically all of the excellent work of the previous year in this area by the district sanitary inspector. Following the withdrawal of the hydraulic dredge, the Dredging Division furnished the sanitary inspector a gang of men who cleaned out some of the ditches and did what was possible to restore the drainage system, but without being able to restore its former efficiency, nor will it be practicable to do so if, as seems likely, this area is to be used again as a dumping ground for spoil from the Canal. Under present conditions, only temporary expedients and costly maintenance can be attempted. The Chief Hydrographer has presented a plan for raising this arm of Miraflores Lake to the height of Gatun Lake (from 54 to 85 feet, approximately), thus giving the former an increase of depth of over 30 feet, and a considerably larger area. While this has been proposed mainly because of its effect on the water supply of Gatun Lake and the surges in the cut affecting shipping, it would greatly benefit the sanitation of Pedro Miguel, through the conversion of a large, wet area into a deep lake with fairly clean, steep banks.

In the Ancon-Corozal district nearly 10,000 feet of permanent rock-covered and open concrete ditches were constructed. The latter type of construction—that of the open half-round, sectional, concrete ditch bottom, as described in the report for 1918, of which several thousand feet have been installed, has not been found as satisfactory as was at first hoped. In the jungle, where there are many large deciduous trees casting their foliage, these drains easily and frequently become blocked, allowing the formation of many small collections of water, and requiring to be cleaned frequently. Although more easily swept and maintained than open earthen ditches, the constant care necessary to prevent breeding during times of slight precipitation makes them a constant source of danger and expense; therefore most of the ditches of this type are being closed in by sectional cast covers and broken rock. In future construction practically all permanent work will be done with 6- or 8-inch concrete tile, made by this department, and covered with broken stone. Only in the Mount Hope district, where there are large, nearly flat, alluvial marshes, and where there is a scarcity of stone, will the open form of concrete ditch be constructed to any great extent.

Fort Clayton, north of Corozal, was finished and occupied in October. A number of malaria cases have developed there among the enlisted personnel and the catch of adult *anopheles* has been large. The Army sanitary inspector has devoted his efforts to clearing the jungle from the edges of streams and in valleys adjacent to the post, and has uncovered many springs, obstructed streams and seepage places. The Rio Cardenas, flowing by the south side of the camp, has many pools caused by bars, rocks, and drift, overhung with grass, in which prolific breeding occurs. These conditions are being

corrected as rapidly as time and funds permit, with considerable improvement already to be noted in the malaria and *anopheles* index.

In the Balboa district the large hydraulic fill west of the Canal, opposite Pier 18, has given rise to *anopheles* breeding in those parts where fresh water from the high land at the back runs out over the fill. Some of this material is still too soft to bear the weight of a man and it has been found possible to spread a mixture of black oil and larvacide by throwing waste, soaked in the mixture, out onto the fill.

In order to determine whether malaria occurs on vessels visiting Canal ports or transiting the Canal, the Surgeon General of the Navy was requested to have medical officers of Navy ships visiting the Canal report directly to the Chief Health Officer any cases of malaria developing aboard ship following such visit. Blanks for reporting cases have been prepared and will be supplied to the ships by quarantine officers on arrival.

The Panama Health Officer still emphasizes the need for sanitating the Sabanas area east of the city. The greater number of cases occurring in Panama live in the San Miguel and Calidonia districts, east of the Panama Railroad, and near the Sabanas car line. Doubtless many of these cases are contracted directly from visits to the unsanitated areas, but there is also the probability that *anopheles* fly into the city from the Sabanas. These sections of the city are occupied mainly by West Indians living in unscreened tenements.

In the foregoing table, the only increase in number of malaria cases is in that of employees contracted in "miscellaneous unsanitated areas outside the Zone." It has required frequent reminders to the residents of the Zone, that, although malaria is not so prevalent in the sanitated areas as it once was, the danger exists in other sections of the Isthmus in unabated form. In fact, the comparative safety of the sanitated areas does much to lull their apprehension of other areas and many carelessly take risks that are unjustifiable.

Malaria from cattle camps and plantations also shows a marked reduction, believed to be due largely to the continued use of prophylactic quinine. While it is admitted that this procedure is not ideal, and that, under ordinary circumstances, there are better ways of controlling malaria, the isolation of these camps, their temporary nature, and the class of labor (these being largely recruited from the infected native population) seem absolutely to require the use of quinine. Every evening for the first two months following the beginning of employment, each man is given $2\frac{1}{2}$ ounces of an alcoholic solution, containing 10 grains of quinine sulphate. After this first period of 2 months, each man is given the same dose morning and evening of each Wednesday as long as he remains in camp. While this treatment is not compulsory, by the cooperation of the foremen it is fairly well carried out, and the malaria incidence has been lowest in those camps where the prescribed measures have been followed closely.

For the sterilization of malaria carriers and the "follow up" treatment of cases of malaria the Chief Health Officer has approved, as the standard for routine treatment, the administration of 10 grains of quinine sulphate by mouth, every evening before retiring for a period of 8 weeks. This is the procedure recommended by the subcommittee on medical research of the National Malaria Committee.

Malaria at Army posts.—The Department Surgeon of the Army reports a gratifying improvement in the malaria rate of troops on the Canal Zone, the rate for 1920 being better than in any previous year.

The comparative rates for the past 3 years are:

	1920.	1919.	1918.
Noneffective rate per 1,000.....	1.12	2.43	1.92
Admission rate.....	47.38	54.37	66.037

For the control of mosquito breeding the Army sanitary inspector reports that, as part of the permanent work with the allotment for this purpose, drains and fills were made by him as follows:

Station.	Dirt drains.	Concrete drains.	Rock and tile.		Fills.
			6" tile.	8" tile.	
	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>	<i>Cu. yds.</i>
Corozal.....	2,295	1,902	2,095	139	665
Fort Clayton.....	135		428		200
Panama secondary.....	1,200				
Fort Davis.....	2,000				1,000
Fort Sherman.....	11,223		2,791	575	1,350
France Field.....	19,734				
Fort Randolph.....	24,436				
Totals.....	62,203	1,902	5,314	714	3,215

Typhoid fever.—There were 36 cases of typhoid fever, of whom 9 died. Five employees, 11 nonemployee residents of the Isthmus, and 19 nonresidents had the disease. Of these, 3 employees (black), 1 nonemployee (black), and 5 nonresidents (4 black, 1 white) died. The nonresidents were all ill upon arrival on ships and did not become infected upon the Isthmus. The cases developing locally were sporadic, except for 4 cases in one family from a small pueblo in the country near Panama City. No other cases developed in that vicinity after the discovery of the infection.

Every local case was carefully investigated as to its origin; contacts were examined for typhoid bacilli, resulting in the discovery of but 2 carriers, 1 an enlisted man in the Army and the other a patient of the hospital for the insane.

Influenza.—There were 1,314 cases of influenza reported from the Canal Zone and adjacent territory, of whom 62 died (*see* Tables IV, X, and XXIII).

The epidemic started the first part of March, 1920. Cases of influenza were reported as follows: March, 801; April, 314; May, 40; June, 138. The first cases were from Colon, but later cases were reported also from all parts of the Canal Zone and Panama and its suburbs. The schools, picture shows, and other places of assembly were closed for a period of 2 weeks. The majority of cases reported were among people who were ill-fed and physically weak—owing to

their poverty—which condition was markedly prevalent immediately after the strike of February 24 to March 4. The epidemic probably started from the fleet of United States Navy vessels stationed in Colon Bay from February 19 to March 1, of which the steamship *Colombia* had 10 cases and the steamship *Pennsylvania* 5 cases on board; the fleet reported 30 cases before arrival in Colon. The rise shown in number of cases reported during the month of June was the result of a local epidemic at the cattle pasture camp at Manawa, there being 82 cases from this camp during June. On March 21, 1920, a ship from Ecuador was received at Balboa quarantine with 6 cases of influenza on board; June 23, 1920, a ship from Peru was received at this station with 23 cases on board; in both instances the local passengers were detained in quarantine 3 days, and the crew and other contacts among agents and port employees were observed and temperatures taken for 3 days. No new cases developed.

Smallpox.—There were reported 25 cases of smallpox during the year, 14 from Panama City and 11 nonresidents. The disease did not at any time become epidemic. The chief source of the infection is from the interior of the Republic, in which smallpox remains endemic, as but few native Panamans outside the cities of Colon and Panama are vaccinated. There were no deaths from smallpox.

Rats and anti-plague work.—Second only to malaria control is the problem of rendering the Isthmus safe from an invasion of bubonic plague. But two cases have originated on the Isthmus since the American occupation. (In 1905 at La Boca, 2 laborers developed the disease and died. A vigorous rat campaign in the vicinity followed and but one infected rodent was found. Apparently the disease was stamped out.)

But bubonic plague exists in North, Central, and South American ports, necessitating strict care in quarantine and internal measures against rats. In building Panama Canal piers and docks every precaution was taken to make them rat-proof. In addition to rat-proof construction of buildings, a circular of the Governor requires all building material, forage, and other stores to be placed so as to discourage rat harboring and favor their elimination. One of the most valuable measures is the placing of practically all kinds of materials on elevated racks, with a minimum of 12 inches clear space below, with open aisles at short intervals between, permitting inspection, trapping, and poisoning and also discouraging the wary rodent from nesting therein. In keeping food from rats the utmost vigilance is exercised. In shops and warehouses have been designated certain places only in which the men may eat their lunches so as to facilitate the collection and removal of all scraps of food. The keeping of chickens and pet animals in the Zone is restricted in order not to furnish food for rats.

Evidence accumulates as to the very large quantity of rats living in the jungles and pastures. At times migrations seem to occur and they have been seen swimming in large numbers in the Canal and lock chambers. The sylvan rat is not so wary as his city brother and is easily seen and caught. During clearing operations about one of the new Army camps the laborers killed hundreds of rats daily. A number of these rats were captured and they and their fleas have been sent to the Bureau of Biological Survey at Washington for identification. Fleas are numerous on the jungle rats.

Trapping and poisoning is regularly done in the terminal cities, chiefly to obtain rats for the laboratory, to which all rats, alive or dead (if not too badly decomposed) are sent for examination. No plague-infected rats have been found.

Of the poisons used, barium carbonate has proved most effective. Many ways of preparing the poisoned baits were tried, in addition to the routine methods of mixing with meal, flour, or chopped fresh meat. In one commissary storehouse, the powder sprinkled on a half cantaloupe caused the death of 24 rats in one night. The health officer of Colon reports the best results, as well as facility in handling the baits, from mixing the barium carbonate in proper proportions in dough and baking as a loaf of bread. Split cucumbers, with the powder sprinkled inside, also proved alluring to the rodent appetite.

It was also attempted to catch rats by means of a viscous, slow-drying varnish spread on baited metal plates, hoping thereby to catch not only the rats, but their fleas as they left the dead bodies. This method proved more efficacious in catching mice, as the rats were generally too wary to become entangled in the varnish. It was shown, however, that once a rat stepped upon the plate his death was certain.

Garbage disposal.—The new incinerator at Colon was completed sufficiently to place it in operation in September.

At this incinerator is destroyed all the garbage of the cities of Colon and Cristobal. Previously the garbage had been burned in the open on dumps, and later, on a temporary, unsheltered, rail incinerator. During the rainy season especially it was very difficult to destroy the garbage by these methods; flies were bred abundantly and numbers of rats were attracted and fed. Following the beginning of operations by the new incinerator the fly infection of the two cities was notably decreased and now the district is as comparatively free from flies as can be expected.

The incinerator on Gavilan Island, destroying garbage from Panama, Ancon, Balboa, Amador, and other places at the Pacific terminal of the Canal, was closed for repairs in December, necessitating, for the time being at least, other methods of handling the garbage. The Health Officer of Panama undertook to dispose of this material on the dump near the beach just outside the city. Each day's collection was brought out in the morning, beginning very early. Every load as it arrived and was dumped was thoroughly sprayed with a solution of larvacide (crude phenol, lye, resin soap liquid) to destroy adult flies and as many larvæ as possible. After placing on the dump and leveling it off, the garbage was covered with 4 to 6 inches of earth to prevent infection by flies. Twice daily thereafter, for 10 days following placing in position, the surface of the dump was sprayed with the larvacide solution. The results were surprisingly good. Large areas of low wet land were filled, with some subsequent sinking, of course, but not enough to restore their bad features. Nuisance from odors and unsightliness did not develop. Some flies, of course, emerged and escaped without being destroyed, but there was nothing like the tremendous breeding that occurred at Colon when garbage was burned in the open. Rats have not been apparent about the dump. Possibly they are repelled by the crude carbolic acid emulsion spray with which the ground is sprinkled. The operation of the dump proved to be much cheaper than incinerating.

Should it prove advisable to continue this method of garbage disposal, there are troublesome low areas, such as the ditches alongside the Curundu River flume, that can be filled with garbage and other refuse, with great permanent advantage to the sanitation of those places.

Venereal disease campaign.—In its basic elements the venereal disease situation remains practically unchanged. Situated at the terminals of the Panama Canal, the cities of Colon and Panama are daily visited by hundreds of seamen of commercial vessels of various nationalities and sailors of the United States Navy, and also by soldiers of the United States Army on the Canal Zone. The constant influx of this type of transient males is naturally calculated to attract a multitude of prostitutes from other countries, as well as native ones, who, learning of the rich harvest to be reaped here, and the light restrictions on their freedom, consider these cities fruitful fields for their activities. A very large proportion of these women, as may be expected, are infected with venereal diseases.

Intimately associated as are the Americans and others living on the Canal Zone with the two Panamanian cities, the problem of venereal disease causes the greatest concern to the authorities of the Canal. Since 1904 there have been about 30,000 cases of venereal diseases among employees and their families treated by Canal physicians. Doubtless a great number of infections escaped being treated and reported.

At a meeting of representative American and Panamanian citizens in 1919 was adopted the "Program of Attack on Venereal Disease" as outlined by the Surgeon General of the United States Army during the World War; but this program has never been satisfactorily carried out because of the radically different viewpoint of the Panamanian people.

In the beginning of the campaign it was not considered advisable to attempt radical law enforcement measures. Effort was directed toward means for diagnosis, treatment and prophylaxis of venereal disease, and toward a general campaign of education to build up sound and clean public opinion, hoping that proper laws and their enforcement might be a later development.

Venereal disease clinics were established at Colon and Panama. The clinic at Colon, opened March 1, 1920, is maintained by the American Red Cross. The Panama clinic was opened August 25, 1919, at Santo Tomas Hospital.

The Colon venereal clinic.—In the 10 months of operation of the Colon venereal clinic, 666 patients were admitted, classified as follows:

	Men.	Women.
Syphilis.....	56	54
Gonorrhea.....	183	57
Chancroid.....	71	25
Syphilis and gonorrhea.....	8	28
Gonorrhea and chancroid.....	6	5
Syphilis, gonorrhea, and chancroid.....		3
Miscellaneous (nonvenereal).....	45	125

	Men.	Women.
Arsphenamine (doses given).....	94	364
Mercury injections.....	18	256
Discharged apparently cured.....	37	60
Average number of visits to clinic.....	4	(¹)
Sent to hospital for treatment.....	12	101
Dark field examinations.....	10	5
Prophylactic treatments.....	340	.....

Wassermann tests: Ninety-one positive, 261 negative, 26 doubtful.

Although the above table shows a fraction less than 58 per cent of the women to be infected, this figure is conservative and probably misleading, as wherever a record is doubtful it is counted as a negative. It is also realized that of the 60 "apparently cured" cases a number may remain infectious, because of the known difficulty of curing chronic gonorrheal endocervicitis by topical applications, and also from the fact that the women usually take a chemical douche before coming to the clinic for examination. Three successive negative smears are required before the case is discharged.

The average number of visits of infected men to the clinic was so small that but little benefit could be expected from the treatment given. Not a man ever completed the course of antisyphilitic treatment. The chief progress was achieved with syphilitic women, most of whom, being compelled to come to the clinic, received sufficient treatment to render them noninfectious for the present at least.

The Panama venereal clinic.—The work of this clinic at Santo Tomas Hospital has been especially valuable. At first but one physician and two nurses were employed, but as the work grew it became necessary to add a second physician to the staff. From an average of 30 or 40 patients daily, the number has grown to over 100 a day, men and women coming on separate days.

The fee for service in the clinic is 10 cents for each applicant registered. This purchases an admission ticket which thereafter entitles the holder to entrance to the clinic. Drugs or prescriptions to be taken to the patient's home are sold at actual cost and patients that are absolutely unable to pay are given free medicine. No charge is made for medicines or dressings used in the clinic. For Wassermann tests the fee is \$2 when the patient is able to pay, but it is given without charge to the poorer patients. Salvarsan is sold at varying prices; to patients who are well able to pay, \$5 per dose is charged; patients unable to pay full price, but capable of contributing something, are charged \$2 per dose; charity cases are furnished free injections when they have no money and would be a menace to the public health if left untreated. Spinal punctures are charged for in the same manner and at the same rate as the Wassermann tests. At present the receipts from the clinic are sufficient to meet all its expense and it is now entirely self-sustaining.

All laboratory work for the clinic is done by the laboratory of the hospital and prescriptions are filled and stock remedies supplied by the hospital pharmacy.

A complete record of every case is kept by the nurse in charge of the records of the clinic. Patients are given literature covering the

¹ Attendance compulsory.

principal points in their disease, and advice as to how to get well by carrying out certain measures and how to prevent the spread of their disease to noninfected individuals. Every new case is investigated in order to locate the source; when the origin can be found, the infected individual is rounded up by the police and held in the detention ward at the hospital for treatment.

In connection with the department of treatment a prophylactic station is maintained and kept open day and night. This station has been widely advertised to the local population and to all incoming ships, and many sailors have taken advantage of the privilege. Since the clinic has been in operation 3,263 prophylactic treatments have been given to men of many nationalities.

A third department is also operated by the clinic, in which all prostitutes that report under the provision of Degree No. 12 of 1918 (Panama) are examined. Under existing laws all these women are supposed to report weekly for examination, but this state of affairs has never yet been, and never will be, realized. By working in connection with the health officer of the city and the inspector of police, it has been possible to increase greatly the number of prostitutes who report weekly. In the beginning only a small number came, but at present this has about been trebled, and the outlook is encouraging. A physical and microscopical examination is made on each case, and every woman found in an infectious state is confined to the hospital for treatment. The noninfected individuals are allowed to return to their abodes. Free antiseptics are furnished these women to take to their homes, with instructions as how they are to be used, and at each weekly visit to the clinic they are questioned regarding their supply and its application.

While in the hospital the infected women are not idle, since a large workroom has been established in which they are made to sew, roll bandages, and pack gauze and cotton, while being treated. It is found that this exercise tends to encourage these people and to maintain them in a more cheerful and tractable frame of mind. It is shortly planned to add a small hand laundry to the work which they are now doing. In addition to helping the hospital while they are confined there, it is hoped to teach at least a part of them an occupation, and later to secure positions for them, so that it will not be necessary for them to return to their former lives upon release from the hospital.

In the accompanying report of Santo Tomas Hospital (q. v.) are given the statistics of the work of the clinic for the year 1920.

It is felt that the educational advantage of the clinic can not be overestimated. Patients report to the clinic from homes which are in many instances wonders of squalor, filth, and disorder. Some of them have been previously treated by quack doctors or by physicians poorly equipped both in knowledge and appliances. To visit a clean, well-furnished room, equipped with shining modern appliances and in charge of a competent physician and nurse, works a wonderful transformation in the minds of these patients. They feel that something worth while is being done for them, and the mental attitude is so much improved that their physical condition reacts accordingly. The patient is made more hopeful, and not only does he return as directed until his condition is improved, but he spreads the news of his recovery to many people of his acquaintance.

While the results that have been accomplished are gratifying, it is thoroughly realized that the field has hardly been touched. So widespread is the feeling in the Republic that prostitution is a necessary evil and that venereal disease is of little consequence, that it is practically impossible at the present time to carry on a campaign that will accomplish more than a limited amount of good results. The best that can be hoped for now is to spread as much favorable propaganda as possible and to attempt to educate the people to a point where, a little later, laws may be enacted which will bring about the abolition of commercial prostitution. At present the law-makers as well as the populace are against any attempt at abolition; consequently it would be futile even to think of accomplishing it under the present government. However, by carrying on the educational work in a vigorous manner for a few years, it is felt that it may ultimately be possible to secure the passage of laws which will eliminate recognized prostitution from the city and limit to a minimum the incidence of venereal disease.

Examination of school children.—The annual physical examination of school children of the Canal Zone was made, starting in October. The results for the white children were as follows:

Number of children examined.....	1,835
Number found needing treatment.....	860
Number with defective teeth as only defect.....	398
Number with defects other than teeth only.....	462
Defects found.....	935
Teeth.....	519
Vision.....	143
Hearing.....	12
Nasal breathing.....	33
Hypertrophied tonsils.....	167
Orthopedic.....	4
Pulmonary.....	2
Malnutrition.....	3
Cardiac.....	11
Chorea and other nervous diseases.....	3
Contagious diseases.....	10
Miscellaneous.....	28
Number vaccinated.....	193

The parents were notified in each case when defect was found, and advised as to proper treatment either by the district physician, in a Panama Canal hospital, or by a dentist. Of the total 935 defects found, but 221 were reported as having been treated. This can not be accepted as an accurate figure, however, as treatment was undoubtedly given in many cases, but not reported to the district physician who made the original physical examination. No record was kept of the defects found in the colored children, but proper advice was given at the time of examination by the district physician.

PANAMA HEALTH OFFICE.

(Dr. HENRY GOLDTHWAITE, Health Officer, Panama City.)

Malaria.—The following table of malaria cases charged to the City of Panama for the years 1914 to 1920, inclusive, shows practically the result of intensive work on the part of this office:

1914.....	2,154
1915.....	614
1916.....	235
1917.....	187
1918.....	97
1919.....	181
1920.....	100

There is no reason to believe that the source of infection in the 100 cases reported for the year just passed, charged to the City of Panama, was from within the city; as it is hardly possible for *anopheles* to come to maturity within the district under charge of this office, the infection doubtless comes from areas beyond our present control. The consumption of crude oil by this office per annum shows graphically fills made and ditches straightened and eliminated:

ANNUAL CONSUMPTION OF OIL.

	Gallons.
1917.....	44,896
1918.....	15,701
1919.....	17,828
1920.....	9,365

Attention is again invited to the necessity for the sanitation of that district near the city known as "Las Sabanas"; the district in question is more or less thickly populated, from the terminus of our present sanitated area, the Tumba Muerta Road, to the Rio Abajo. The area could be sanitated without much trouble, and at a moderate expense. This should be done not only for the benefit of the Panamanians but for the many employees of The Panama Canal who use the Sabanas Road for pleasure trips; the use of this road will constantly increase, with a corresponding increase in the cases of malaria, as the improvement of the Sabanas Road progresses toward Chepo.

Infant mortality.—The following shows the annual death rate of infants under 1 year of age for the years 1914 to 1920, inclusive:

	Rate per thousand.
1914.....	272
1915.....	221
1916.....	235.86
1917.....	237.73
1918.....	188.27
1919.....	154.47
1920.....	155.30

Smallpox.—A total of 14 cases of smallpox was reported as having occurred in the city of Panama during the year 1920; these cases all originated from points outside of the city. During the year 17,294 persons were vaccinated by this office. Many of these vaccinations were done on persons entering the City of Panama by water from other parts of the Republic, which is beneficial in so far as it relieves us of the care of smallpox patients and, of course, is gradually lessening the danger of infection from the interior.

There was issued a total of 3,205 vaccination cards to persons leaving the Republic by sea. The majority of these individuals were West Indians.

Veterinary work.—Fees collected as a result of the work of veterinarians attached to this office amounted to \$3,586.99, which sum includes fees collected for inspection of cattle and swine and disinfection of hides and skins.

There were 15,023 head of cattle and 11,402 hogs killed and inspected at the Panama abattoir under the supervision of our veterinarians. Of these the following were condemned: *Cattle*—Septicemia, 8; anthrax (died in pen), 3; infiltration and ecchymosis, 3; sunstroke, 2; tuberculosis, 1; gangrene, 1; asphyxia, 1; steers

(cause not stated), 5; total, 24. *Hogs*.—Measles, 609; sunstroke, 59; sucklings (cause not given), 18; cholera, 10; gangrene, 3; tuberculosis, 2; tetanus, 2; pyemia, 2; urticaria, 1; pneumonia, 1; total, 707.

Flies.—The use of fly paper and fly traps has practically been abolished by this office. We are using instead wires, dipped in what might be termed "tanglefoot mixture." This method seems to be more successful, but of course the main point in the elimination of flies is in the destruction of their breeding places. This is being continually done, but no city of this size can ever hope to be absolutely flyless, and it is a constant fight.

Milk and dairies.—The milk situation continues to improve. A more or less flexible standard of 300,000 bacteria per cubic centimeter for raw milk has been set by this office, and the present bacterial count shows many samples having considerably less than 100,000 bacteria per cubic centimeter. With the passage of time, the dairy owners are becoming aware of the fact that cleanliness means more money to them. It is but a repetition of the history of all cities where supervision of the milk supply has been attempted. Possibly we have had less trouble than in any place in the United States of similar size, mainly for the reason that the orders from this office are mandatory, and there is practically no appeal therefrom.

The "Lecheria Central," or central plant to which all milk from the various dairies is sent, was opened for service in January, 1920, since which time no milk has been sold in the city except that which is pasteurized at this plant. The lecheria is owned and operated by the dairymen's association. A limited quantity of clean, fresh butter is also produced by the plant. As soon as an adequate supply of bottles of the standard size (1/5 gallon) can be secured it will be required that all milk be also bottled at the plant and that no loose milk be sold.

Fines.—There were 1,425 fines imposed for violation of sanitary regulations and \$2,684.50 collected as a result thereof.

Garbage disposal.—At the time this report is written we are burying all garbage from the City of Panama and the terminus of the Canal, owing to the necessity for extensive repairs on the Gavilan Island incinerator. This method of disposal is being done at an approximate cost of \$1,265 per month for the total work, as against a 3-year average of \$2,410.64 per month for incineration of the garbage from the City of Panama alone.

Venereal diseases.—During the year 395 cases of syphilis were reported to this office and 1,111 cases of gonorrhoea; this by no means represents the actual total, as it is almost an impossibility to have physicians report their venereal cases; constant urging seems to have little effect upon them.

Tuberculosis.—The number of deaths from tuberculosis for the years of 1914 to 1920 inclusive, are as follows:

1914.....	229
1915.....	245
1916.....	313
1917.....	348
1918.....	254
1919.....	241
1920.....	206

The Health Officer is of the opinion that the number of deaths from tuberculosis will be largely reduced if we can enforce the regulation requiring each person to have at least 300 cubic feet of air space in living quarters. The enforcement of this regulation would not only tend greatly to reduce the number of deaths from tuberculosis but should naturally result in a reduction in the infant mortality rate.

COLON-CRISTOBAL HEALTH OFFICE.

(Dr. J. L. BYRD, Health Officer.)

The new concrete Panama Railroad stables, thoroughly rat-proof, offering every facility for cleanliness, and affording accommodation for all the privately owned animals of the city, were completed during the year and all the old unsanitary private stables in the city have been demolished.

The new garbage incinerator was placed in operation on September 1, and has been operating continuously ever since. It has two 30-ton units, or a rated capacity of 60 tons in 24 hours, but as at present operated it is consuming an average of 60 tons in 16 hours of each day, 50 per cent more than the rated capacity. No fuel is used, yet all kinds of garbage, manure, and rubbish are consumed without difficulty. By the addition of another unit, of 50 tons capacity, the operating expense could be reduced, possibly, by 30 per cent and much of the wear and tear of present machinery from overwork would be prevented.

The improvements in stables and garbage incineration have practically eliminated all the principal fly-breeding areas in Colon and for the past 3 months the city has been remarkably free from flies.

Several improvements were made in the Colon municipal market during the year. A new roof with skylights was placed on the building, the wooden vegetable counters were replaced with concrete slabs and the meat stalls were inclosed by wire netting.

Infant mortality.—The infant mortality rate during 1920 was 142.41 as compared with 155.29 for 1919. The rate continues to remain high, due principally to the economical status and marital conditions of the larger percentage of the population of the city. The fresh milk supply for Colon amounts to less than 40 gallons per day, which is absolutely inadequate. The erection of a modern sanitary plant for the reconstruction of powdered milk is very greatly needed in this city. However, it seems the Panamanian authorities do not think so, for they have absolutely refused to allow the installation of such a plant in the city of Colon.

Street cleaning.—Most of the streets in Colon are in a very bad condition from lack of repairs. The concreting of these streets is a much-needed improvement and would greatly facilitate cleaning. It is recommended that a modern street-sweeping machine be purchased for the purpose of sweeping all paved streets in Colon and Cristobal. This would expedite the work and reduce the force necessary to keep streets clean.

Fines imposed for violation of sanitary regulations during the calendar year numbered 453, amounting to \$984.

Antirat work, such as rat-proofing of buildings, elevation of bulky material and foodstuffs from the floor or the ground, thorough collection and disposal of garbage every 24 hours, and poisoning and

trapping for the purpose of detecting any rodents that might be plague-infected, was carried on during the entire year. Barium carbonate mixed thoroughly with the other ingredients of bakers' bread and same baked into the ordinary loaf was found to be the most satisfactory method of using this poison.

This office found it necessary to employ a force of laborers to do concrete repair work for private parties in Colon. We collected \$5,443.55 for such work during 1920.

Veterinary work:

Quarantine inspections:	
Cattle.....	29,159
Hogs.....	10,876
Ante and post mortem inspection:	
Cattle.....	30,771
Hogs.....	10,731
Condemnations:	
Carcasses, cattle.....	35
Parts, cattle.....	1,350
Colon.....	150
Cristobal.....	1,200
Carcasses, hogs.....	516
Colon.....	162
Cristobal.....	354
Hogs passed for sterilization.....	141

A charge for inspection of 25 cents for cattle and 10 cents for hogs per head is made against the Colon abattoir. The collections for this work since this charge was authorized (August 10, 1920) amounted to \$982.05.

Food inspection.—During the past 2 months one sanitary inspector was assigned to food inspection only. The results have been very gratifying as shown by the improvement in the general cleanliness and sanitary condition of bakeries, dairies, ice cream parlors, restaurants, hotels, messes, etc. The following establishments are now receiving regular and systematic inspection by the food inspector: 10 hotels, 37 restaurants, 3 messes, 18 bakeries, 5 bottling works, 8 markets, 48 vendors, 14 ice cream parlors and soft drink stands, 6 dairies.

Mount Hope district.—As conditions warrant, antimalarial work in Mount Hope district has been gradually extended; 30,242 linear yards of open drains were installed during the year. The installation of very narrow drains in low swampy areas is being tried out extensively in this district and they have proved very satisfactory.

The antimalarial work in the district has been effective this year, as is shown by the low malarial rate compared to former years. It is contemplated to install an extensive system of tile drains throughout the district during the next dry season in order to reduce the cost of maintenance of open drains.

DIVISION OF QUARANTINE.

(Surgeon S. B. GRUBBS, U. S. P. H. S., Chief Quarantine Officer, January 1, 1920, to October 27, 1920.)

(Surgeon W. C. RUCKER, U. S. P. H. S., Chief Quarantine Officer, October 28, 1920, to December 31, 1920.)

It has been the constant aim of the Chief Quarantine Officer to administer the quarantine regulations with the minimum inter-

ference with commerce and to reduce restrictions and delay of shipping to the lowest point compatible with reasonable safety to the health of the Republic of Panama and the Panama Canal, the personnel of vessels touching at Canal ports and of the countries to which they are destined. Communicable disease may be brought here from the entire globe, and without proper sanitary supervision, the Isthmus is capable of becoming a focus for the redistribution of disease to many far distant points; the prevention of this by maritime quarantine is a problem resolving itself into:

(a) Securing accurate first-hand knowledge of the sanitary condition of ports dangerous to the Panama Canal.

(b) Stimulating the owners and operators of ships to prevent the ingress of infected persons, animals, and things to their vessels.

(c) The routine inspection of vessels and their personnel at ports of arrival in the Canal Zone, the isolation of infected or potentially infected persons, the fumigation of infected ships, and the periodic fumigation of vessels for the destruction of rodent and insect carriers of disease.

In the application of these sanitary safeguards it has been constantly borne in mind that it is the living disease vector which is most to be feared and it is this danger, rather than the inanimate disease carrier, which accordingly has been stressed.

In mid 1919, Doctor Grubbs, then Chief Quarantine Officer, was detailed to make a tour of inspection of the west coast of Central America. The ports visited were Punta Arenas, Costa Rica; San Juan del Sur and Corinto, Nicaragua; Amapala, La Union, and Acajutla, Salvador; and San Jose de Guatemala. Also the interior cities of Grenada, Managua, and Leon in Nicaragua were visited.

The objects of this trip were (1) to gain first-hand information of conditions, (2) to establish personal relations in order to obtain information by more direct means, (3) to stimulate preventive measures, especially regarding yellow fever, and (4) to modify our procedure at Balboa to correspond with actual conditions and necessities.

All these objects have been accomplished in a very satisfactory manner. If the Canal authorities can stimulate neighboring countries to prevent such diseases as yellow fever and plague, they will be protecting themselves and will facilitate commerce to the benefit of the Canal and the world as a whole. Not only has a warning against plague been sounded but arrangements have been made, or are pending, that will do a great deal to prevent the recurrence of yellow fever in the future. In Corinto a permanent sanitary inspector will devote his entire time to *stegomyia* elimination. As long as this work is continued yellow fever will spread to a very limited extent, if at all, in Corinto.

As to changes in quarantine procedure: (1) *La Union*.—We formerly required vessels to leave the wharf at 5 p. m., otherwise they would be fumigated on arrival at Balboa. This restriction has been removed because there is no mosquito breeding on the wharf; if there were, it is doubtful if they could get aboard a vessel. The removal of this restriction is of more advantage to shipping than is at first apparent as, on account of a strong cross current, it is possible to dock only on a slack tide and a vessel moving out to anchor at night may not be able to get to the dock until noon the next day.

2. *Corinto*.—Vessels were required to anchor in the stream at night, and the fumigation of vessels before sailing has been required since last August. Both these restrictions have been removed for the same reasons that apply at La Union. Inspection of all of Corinto for mosquito breeding has been in progress for some time. (3). *Punta Arenas*.—Formerly our restrictions required that passengers who had stopped over night be quarantined; those who had been in the port during daylight only were not held. This restriction has now been removed for two reasons (1) Punta Arenas has had no yellow fever for several years nor have there been any known cases in Costa Rica and the mosquito conditions are not bad; (2) passengers can leave Punta Arenas for Cristobal via Limon against which no quarantine is maintained, and if connections are good arrive in 2 days and are not delayed.

Experiences during the past month have strengthened the belief that such inspection trips are of the greatest value and should become a fixed policy of the quarantine service. We must help our neighbors to keep free of quarantinable disease, and in our quarantine we have a means of bringing this about for their own and our good, for the ultimate aim of quarantine should be the abolition of disease and not walling ourselves in against outside dangers we take no steps to abolish.

A similar tour of inspection was made of the western ports of South America. The following quotations from Doctor Grubbs' report indicate the results accomplished:

Observations are attached hereto in the form of notes on the ports visited. In addition, a trip was made to Quito to express to the President of Ecuador and other officials the interest and appreciation felt for the radical manner in which yellow fever has been eliminated from Guayaquil, to assure them that we are ready to promptly recognize such work by modifying our quarantine procedure and to suggest that similar steps be taken against bubonic plague.

At Lima a similar call was made, at the suggestion of the American Ambassador, upon the President, to express our interest in the extensive sanitary campaign he has inaugurated in Peru and especially in the efficient work now being done in the province of Piura.

As there is no yellow fever at Guayaquil, and the city is probably noninfectable at present, it is evident that the quarantine against persons from that port should be entirely removed so long as such conditions are maintained. This action will be the strongest possible incentive to have the present conditions maintained. As the minor ports of Ecuador were always infected from Guayaquil, their quarantine should similarly be lifted. The fumigation of all freight from Paíta should be stopped as it is now arranged to have all lighters at that port fumigated whenever used for loading our ships, and for the fumigation of all dried hides, which are the only freight that may carry rats. As Paíta is free from yellow fever and from stegomyia it will be proper to allow the quarantine officers, in their discretion, to count such time as may have been spent in Paíta or Talara as against the quarantine period of passengers.

All Ecuadorian ports have doubtless had yellow fever from time to time, but probably have none now. The infection undoubtedly has come in the past from Guayaquil, as quarantine has been enforced rigidly against foreign ports, but rarely against those of Ecuador. There is no quarantine physician except at Manta and here quarantine was in force against Paíta and Buenaventura and enforced by keeping all vessels that had touched at these ports, no matter how many days before, in quarantine with all hands until 6 days from arrival had elapsed.

Guayaquil is a city of 94,000 inhabitants on the Guayas River. Site is for the most part flat and during the torrential rains that fall in the wet season (December to March) is partly under water. During the dry season of 8 months there is practically no rainfall and the city is dry except for some brackish marshes on the outskirts. Guayaquil was destroyed by fire in 1896 and when rebuilt was laid out with wide regular streets. Active work is now going on to put down concrete and asphalt paving. Unfortunately this is being done in places before sewers are put in. The houses are mostly wood, or wood frames with stucco covering. In the poorer

parts they are of wooden frames with flattened bamboo sheathing. A few rat-proof concrete buildings are being constructed, but as cement costs 18 sucres (\$8.00) a barrel these are the exception.

Yellow fever has been endemic in Guayaquil for years and persisted in spite of several attempts at its suppression until the campaign instituted by the International Health Board. This was begun in November, 1918, and was successful, the last case being reported in June, 1919. Guayaquil is not only free from yellow fever now but is undoubtedly noninfectable.

Antistegomyia work has been done in a less intense form in the small towns near Guayaquil, especially along the Guayaquil and Quito Railroad from Duran (across the river from Guayaquil) to Huirara.

Bubonic plague is prevalent among the rats at Guayaquil. The last human case was reported last April.⁴ Considerable work is being done, probably as much as is possible under the circumstances, but this is directed as much against human cases as to the elimination of the disease among rats.

The U. S. Public Health Service has for years maintained an officer at Guayaquil. Since the resignation of the last regular officer, an Ecuadorian graduate of an American medical college has been on duty. He issues the U. S. bill of health on board just before each vessel sails for a United States port. Before doing so he inspects the officers, crew, and passengers and fumigates (Clayton apparatus) the holds that have received freight, and the crew's quarters.

Paita, Peru: This is northernmost port of Peru touched by regular lines; 2,700 inhabitants. The bay is a mere indentation but is protected by a point so that it is almost always calm. Weather is moderate and bright. It practically never rains. Paita is the outlet for the important valleys of the Piura and Chira rivers. Its exports are almost entirely cotton, with some dry hides. Paita and the surrounding towns have had two severe outbreaks of yellow fever and plague within the past year. Yellow fever has almost disappeared following an antistegomyia campaign which is still in force. Plague is also improved but this is due more to the natural extinction of rats by the disease than to any human efforts. Extensive plans have been completed for the rebuilding of a sanitary and rat-proof Paita to follow the burning of the present town which is made largely of cane and mud, but delays have continued.

No yellow fever has appeared south of the Province of Piura for many years but the entire coast may be considered plague-infected.⁵ The ports down to Callao are all open, usually quite rough, dry, and barren. Vessels all lie out one mile and load by means of open lighters.

Callao (population 50,000) is the chief seaport of Peru and the port for the capital. Lima, 8 miles inland, with its suburbs is said to have 400,000 inhabitants. Yellow fever has not been reported in these cities for several years although there are many stegomyia, especially in summer. Our chief consideration is for plague, which is endemic. The health authorities are absolutely indifferent to this disease, make no efforts to catch rats or to change the form of construction even in new buildings. Callao is 4 days from Balboa by direct steamer."

The following memorandum was issued by the Chief Quarantine Officer, August 26, 1920:

"Memorandum for the Quarantine Officers, Cristobal and Balboa:

"The 6-day detention period for passengers in good health from Guayaquil and other Ecuadorian ports, is no longer required.

"The Province of Piura, Peru, is under yellow fever quarantine, but the ports of Paita and Talara may be considered entirely safe from yellow fever in computing the 6-day quarantine period. You are authorized to take into account the time that passengers arriving at Balboa have spent in the city of Paita, or in Talara, or the oil field adjacent thereto. The above must be considered as a distinct concession and passengers must be prepared to present evidence that will satisfy you that they have complied with this requirement, or they must remain at the quarantine station to complete the 6-day period.

The object of this arrangement is to relieve those places where efficient anti-mosquito work is being maintained from quarantine restrictions, at the same time keeping such restrictions upon interior points where this work has not sufficiently advanced."

⁴In the last 5 months of 1920, 92 cases of human plague were reported from Guayaquil (U. S. P. H. S. Reports.)

⁵Since January 1, 1921, an extensive prevalence of yellow fever has been reported in the Department of Lambayeque, south of the Province of Piura, probably existing for some time previously. At present a 6-day quarantine is enforced at Balboa against all ports north of Callao.

The Quarantine Officer of Cristobal was detailed to make an inspection of Buenaventura and Tumaco, Colombia, with a view to recommending what quarantine restrictions should be enforced against these ports. The following excerpts from that officer's report are self-explanatory:

Buenaventura: The rainfall is about 400 inches annually and is well distributed throughout the year. The tide enters the lower levels of the town, and with the rainfall, is an important factor in keeping the town in a habitable condition. I slept on shore but did not encounter any mosquitoes. The water containers are well screened. This is the port for Cali, Manizales, and other places. In my opinion, there has been no yellow fever here since 1915 and then the infection was probably introduced from Guayaquil.

It is recommended:

1. That the quarantine be lifted, provided that within 3 months an active anti-mosquito campaign be underway.
2. That the Colombian Government finance this campaign and that the sanitary officers of the government direct the work.
3. It is suggested that in carrying out the work, the sanitary officer secure the cooperation and assistance of Mr. Walsh, the American Consul.
4. That our attitude at the end of 3 months depend on the manner in which the above recommendations are carried out, as shown by reports from Mr. Walsh, and their compliance with suggestions offered by him.

Tumaco: This town is 537 miles from Balboa and is situated in the southwestern corner of Colombia. It has a population of 6,000 and is located on an island which is about 5 feet above sea level. The soil is sandy and no water remains after the rains, except that collected in screened tanks and barrels. The sanitary conditions are the best I have seen in any of the smaller towns of Latin America. There is no trace of quarantinable disease having occurred here for at least 15 years. It is earnestly recommended that the quarantine be lifted at once.

Following the receipt of this report the following instructions were issued:

To the Quarantine Officers, Cristobal and Balboa:

1. The 6-day detention period for passengers in good health from Tumaco is no longer required.
2. The 6-day detention period for passengers in good health from Buenaventura is provisionally lifted.

During the year the general quarantine instructions have been entirely revised and amendments relative to night quarantine service have been promulgated. On February 5, 1920, the quarantine regulations were extended to include influenza and similar diseases as maritime quarantinable diseases.

The following instructions relative to vaccination have been followed throughout the year:

To Quarantine Officers: In order to facilitate travel and to avoid unnecessary vaccination of passengers who are amply protected against smallpox, quarantine officers are authorized to issue a certificate of vaccination which will be good for 5 years after they have vaccinated an individual and have personally observed either (1) successful vaccination, (2) vaccinoid, or (3) immune reaction.

The following technique must be strictly followed: The part to be vaccinated (preferably deltoid insertion) should be washed with soap and water, if necessary, and in any case with alcohol. After vaccination it is advisable to expose the arm to the open air for 15 minutes before the clothing is allowed to touch it. No shield or other dressing should be applied.

Vaccinate by one of the following methods:

1. Linear incision or abrasion. Use a sterile needle and with a single downward stroke for each make three scratches, each $\frac{3}{4}$ -inch long, parallel to each other and to the humerus, and 1 inch apart. Rub vaccine into two of these scratches, using a sterile toothpick, or other instrument. The third scratch will be used for a control.
2. Drill method. A sterile drill or dental chisel, about 2 millimeters wide may be used. With a twisting motion and moderately firm pressure make three small circular abrasions, 1 inch apart, two above and one below. Rub the virus into two of these abrasions, leaving the third for control.

Direct patient to return for observation on the second and fifth day. When time is limited, 24 hours may be sufficient to observe reaction of immunity and when this is established certificate may be issued. After observation of the fifth day in those not previously vaccinated, it may be necessary to have them return on the seventh and later days.

The following reactions only are recognized:

1. *Successful vaccination.*—In previously unvaccinated persons or in those whose immunity has completely disappeared, there should be present on the fifth day a vesicle, linear or circular, surrounded by a narrow areola, which progresses to a typical take on about the tenth day.

2. *Vaccinoid.*—In those whose relative immunity is somewhat low, this milder form of vaccination exhibits itself on the fifth day as a smaller vesicle with a larger areola. The duration of the reaction is shorter and less severe.

3. *Immune reaction.*—Where the immunity of the individual is high, either from a previous vaccination or from an attack of smallpox, a subsequent attempt at vaccination results in a prompt, sharp reaction which reaches its maximum in about 48 hours and may entirely disappear within 4 days. At the site of the inoculation there is a small reddened papule, linear or circular, surrounded by a very narrow areola. Itching is prominent.

Either of the foregoing reactions builds up or indicates immunity and warrants issuing a certificate good for 5 years. If none of these reactions occurs the result should be considered a failure and no certificate issued. Complete absence of reaction means inert virus or faulty technique.

The above instructions do not prevent issuing of temporary certificates immediately after vaccinating to those who must leave at once, but these should not be given where a failure is observed unless applicant is revaccinated.

THE ECONOMICS OF MARITIME QUARANTINE.

Surgeon Grubbs made a study of the economics of maritime quarantine not only from the viewpoint of the indirect effect which the Canal quarantine exercises upon the health and therefore upon the commercial prosperity of ports from which shipping passes to the Canal, but also from the aspect of the actual saving which accrues directly to ships through the reduction of detentions to the lowest margin of safety. It is manifestly impracticable to arrive at an absolutely accurate figure which will represent the average ton-detention-day loss of a ship in detention or an average passenger-detention-day loss for persons held in quarantine. The figure of 50 cents per ton-day for the former and \$5 per passenger-day loss were therefore arbitrarily assumed. For all practical purposes these figures are accurate enough and by applying them it becomes possible to estimate and compare the results obtained from year to year. Thus in 1918, there were 151,176 ton-detention-days and 38,169 passenger-detention-days with a total direct loss of \$267,935. In 1919 the loss was \$173,538 and in 1920 it was \$191,226. These figures show decreasing loss but unless the ratio of the loss to the total tonnage received is given the picture is not complete. In 1918 this loss was \$23.15 per thousand ton received; in 1919 it was \$12.02; and in 1920 it was \$8.64.

This is set forth in the following table:

Year.	Total tons received.	Total ton-detention-days.	Total passenger-detention-days.	Total loss.	Loss per 1,000 tons received.
1918.....	11,572,473	154,176	38,169	\$267,935	\$23.15
1919.....	14,512,721	161,376	18,570	173,538	12.02
1920.....	22,128,254	48,172	33,436	191,266	8.64

QUARANTINE TRANSACTIONS AT COLON AND CRISTOBAL DURING THE CALENDAR YEAR 1920.

Vessels inspected and passed.....	2,339
Vessels detained in quarantine.....	5
Vessels given provisional pratique.....	19
Total.....	2,363
Number of days vessels were held in quarantine.....	6
Supplementary inspections of vessels.....	1,575
Vessels fumigated:	
For mosquitoes, SO ²	18
For mosquitoes, Na Cn.....	7
For mosquitoes, SO ² and Na Cn.....	6
For rats, SO ²	49
For rats, Na Cn.....	2
For rats, SO ² and Na Cn.....	25
Total.....	107
Crew inspected on arrival.....	118,136
Passengers inspected on arrival.....	43,657
Crew passed on certificate of medical officer.....	43,618
Passengers passed on certificate of medical officer.....	10,814
Total.....	216,225
Supplementary inspections of persons on detained vessels.....	4,612
Persons detained in quarantine station.....	1,725
Number of days held.....	3,452

Immigration.—The inspection of immigrants has continued as in previous years.

ANCON HOSPITAL.

(Col. L. T. HESS, U. S. Army, Superintendent.)

Buildings and grounds.—A 2-story addition was built to the power-plant building; on the ground floor is the new carpenter shop, twice as large as the former one, and on the second floor are the electrical shop and miscellaneous stores of the electrician, carpenter, painter, and plumber. Following the change, the hospital bakery was transferred from the kitchen-mess hall building into the portion of the power-plant building formerly used as plumbing and carpenter shops, and the former bakeshop was occupied by the general mechanic as workshop and storeroom.

A storage and receiving room for the undertaker's department was built as an addition to the Board of Health Laboratory.

All chronic patients having been transferred to Corozal Hospital for the crippled and insane, the old frame building formerly occupied by these chronic cases was turned over to the Supply Department, razed, and reerected on one of their plantations.

The old morgue and the old carpenter shop were evacuated and turned over to the Supply Department.

Considerable work has been done toward improving the grounds by grading, sodding, planting of trees, etc. One hundred orange

trees, 50 grape fruit, and 25 avocado (alligator pear) trees have been set out. From trees already bearing on the hospital grounds the following amounts of fruits were gathered for use by the hospital:

Bananas (stalks).....	290	Papayas.....	285
Bread fruits.....	687	Mangoes.....	7,841
Avocados.....	1,089	Guavas.....	2,385
Limes.....	18,658	Coconuts.....	234
Oranges.....	285	Sour sap.....	15

The hospital recommenced bakery operations in December. Thirteen thousand one hundred and twelve pounds of bread were made from 9,429 pounds of flour, the net cost per pound of bread being \$0.0654.

Motor transportation.—All cars were kept in good state of repair; all mechanical repairs, except emergency road repairs, are now made in the motor car house instead of in the hospital garage, by the employees of the motor car inspection department instead of by the local hospital chauffeur-foreman. This has resulted in increasing the operating cost of our transportation, without increasing the efficiency of the service in any respect. Certain of the transportation is requiring considerable repairs and will probably have to be replaced before long.

Operating expenses.	Cost of equipment.	Net running expenses.		Mileage.	
		1920.	1919.	1920.	1919.
Truck No. 282.....	\$844.59	\$1,170.56	\$1,090.67	6,700	7,591
Truck No. 1209.....	833.21	1,199.80	617.02	7,258	3,452
Hearse No. 305.....	1,412.74	707.33	580.09	1,248	1,605
Ambulance No. 301.....	632.50	1,320.42	1,347.05	6,917	7,597
Ambulance No. 303.....	604.02	2,021.02	182.88	7,834	770
Ambulance No. 307.....	658.41	.....	1,048.76	.....	5,405
Ambulance No. 308.....	762.30	1,975.33	1,649.94	8,935	8,035
Total.....	\$5,747.77	\$8,394.46	\$6,516.36	38,892	34,445

Surgical clinic.—During the year 1,655 major operations and 5,781 minor operations were performed. Two thousand eight hundred forty-three cases visited the out-patient department, for whom 408 prescriptions were written. Two hundred eighty-nine obstetrical cases were delivered.

Medical clinic.—There were 2,738 cases treated in the out-patient department, for whom 1,650 prescriptions were written.

Eye and ear clinic.—Cases visiting the out-patient department numbered 7,542 for whom 2,650 prescriptions were written. One thousand fifty-two refractions were made and 1,215 operations performed.

X-ray clinic.—There were 2,608 cases handled; 5,324 plates; 364 X-ray films; 1,533 dental films taken; 50 treatments given.

Steward's department.—During the year 155,831 rations were issued to Ancon Hospital patients and 90,767 rations issued to personnel entitled to subsistence, a total of 246,598 rations; the net cost was \$114,189.55.

There were 36,897 rations issued to pay boarders, mostly nurses who are charged \$20 per month; the payments for these amounted to \$18,744.65.

REPORT OF PATIENTS DAYS.

1920.....	296,946
1919.....	312,737
1918.....	319,908
1917.....	311,451
1916.....	270,294
1915.....	268,945
1914.....	338,901

COST OF SUBSISTENCE PER PATIENT PER DAY (ANCON HOSPITAL ONLY).

1920.....	\$0.463
1919.....	.3495
1918.....	.315
1917.....	.3369
1916.....	.2522
1915.....	.2372
1914.....	.253

MOVEMENTS OF PATIENTS, NONRESIDENTS OF CANAL ZONE.

	Total number treated.			Died.			Days treated.		
	Ancon Hospital.	Corozal Hospital.	Total.	Ancon Hospital.	Corozal Hospital.	Total.	Ancon Hospital.	Corozal Hospital.	Total.
1917..	274	76	350	7	3	10	5,101	21,396	26,497
1918..	510	76	586	9	10	19	7,667	20,431	28,089
1919..	883	56	939	19	3	22	15,434	17,245	31,779
1920..	1,250	54	1,304	16	1	17	24,418	15,979	40,397

	1920.	1919.	1918.	1917.	1916.
Chronic patients:					
Total number treated.....	33	34	38	63	52
Total number of days treatment.....	9,626	9,710	8,603	9,836	9,174
Average number of patients per day.....	26	27	26	27	25
Average per capita cost.....	\$0.315	\$0.2654	\$0.2602	\$0.2520	\$0.2400
Movement of military patients:					
Total number of admissions.....	860	1,392	4,165	2,469	1,937
Total number of days relief.....	15,134	22,217	49,067	33,494	28,519
Average number constantly sick.....	41.35	60.90	134.49	91.76	78.13
Admissions:					
To Ancon Hospital.....	9,783	10,503	12,153	10,880	9,116
To Corozal Hospital.....	170	151	229	191	225
To chronic ward.....	7	8	13	45	26
To cripple farm.....	12	17	39	54	59
Totals.....	9,972	10,679	12,436	11,170	9,426
Deaths:					
Ancon Hospital.....	276	343	336	368	325
Corozal Hospital.....	32	43	73	30	57
Operations:					
Major surgical operations.....	1,655	1,688	1,784	1,684	1,465
Minor surgical operations.....	5,781	5,813	4,424	1,775	1,333
Eye and ear operations.....	1,215	1,044	1,088	855	622
Refractions.....	1,052	1,263	1,312	1,108	1,378
Obstetrical cases delivered.....	289	314	321	301	246
Out-patient department:					
Total visits.....	13,123	13,833	14,276	11,784	13,188
Prescriptions written.....	4,708	5,424	4,230	3,798	6,289
Dispensary (district physician), Ancon:					
Total treated.....	105,171	102,034	92,201	142,290	130,219

FINANCIAL STATEMENT.

	1920.	1919.
Operating expenses.....	\$705,836.14	\$592,456.78
Revenues.....	438,582.01	322,222.37
Gross cost per patient per day (Ancon Hospital only)	3.82799	3.08166
Net cost per patient per day (Ancon Hospital only).	1.57536	1.65233
Operating expenses, Ancon Hospital.....	592,691.54	492,366.09
Revenue, Ancon Hospital.....	348,776.06	228,367.77
Operating expenses, Corozal Hospital.....	94,164.03	80,870.96
Revenue, Corozal Hospital.....	88,927.95	89,330.60
Operating expenses, dispensary.....	18,264.89	13,168.59
Revenue, dispensary.....	643.25	528.00

A more detailed statement of operations, etc., will be found in the statistical tables at the end of this report.

Among the recommendations of the Superintendent of Ancon Hospital, to cover more or less pressing needs of the institution, are the following:

1. Nearly all new hospital construction in the United States provides for hydro- and electro-therapeutic apparatus, the need for which in the tropics is greater than in the temperate zone. Residence in the tropics induces nervous conditions which are amenable to hydro- and electro-therapeusis and the establishment of such a service in Ancon Hospital is recommended. Room therefor could be provided with small expense, in the basement of Administration-Clinics Building, the equipment being the main item of expense.

2. The organization of a urological-skin service, now under the surgical service, will enable the hospital to care more satisfactorily for venereal and skin cases, which are not now, owing to the lack of a physician particularly qualified in genito-urinary work, receiving the attention they should. This proposed service can be taken care of on the third floor of the Administration-Clinics building, or in the proposed out-patient clinics building recommended below.

3. An "out-patient clinics" building, of reinforced concrete in harmony with design of present hospital structures, on the site near the dispensary is recommended for the purpose of housing the medical, surgical, and genito-urinary out-clinics and pharmacy. The present location of those clinics in the Administration-Clinics building renders them very inconvenient of access to out-patients visiting them.

4. With completion of permanent hospital buildings, steps should be taken to provide permanent quarters for hospital staff and gold employees in accordance with proposed plans. At least two of these quarters buildings should be constructed each year until completion of proposed layout.

5. A recreation hall, consisting of two large open pavilions of reinforced concrete in keeping with design of other hospital buildings, located on the hillside, is desirable for the use of convalescent patients. Such a building should be provided with covered passageways from the other sections of the hospital. The hillside should be terraced and set out in tropical plants and trees (mostly fruit

trees) and improved by walks, etc., to provide a suitable place for exercise of convalescent patients, especially those having tuberculosis, for whom no suitable means of out-door exercise is now provided.

6. Provision should be made for a sanitorium at some suitable place within the Canal Zone for the treatment of tuberculosis, with a view to segregating this class of patients. Under present conditions, these cases are sent into Ancon Hospital, for segregation in the isolation section, which is not well adapted nor of sufficient size for their accommodation.

7. Two large tennis courts and a swimming pool should be constructed for the use of gold personnel in close proximity to the nurses' quarters. Some form of exercise is absolutely necessary in this climate to maintain hospital employees in the state of physical fitness demanded by their duties.

8. The nurses' quarters at the present time do not provide sufficient quarters for the nursing staff; it has been necessary to double up in a few rooms, and for others to be quartered elsewhere. The nurses' home provides quarters for only 70 nurses, while 78 are on duty. Such congestion is not conducive to the best interests of the service, and provision should be made so that each nurse will have a room.

9. *Extension—Section B.*—Build an addition (basement and two stories) to rear of service section. This addition is needed so that the private rooms in a portion of this section will have an outside corridor similar to that of the other private rooms. At present these rooms are not desirable for use of private patients on account of the sun shining directly into the rooms during the days when it shines and during inclement weather the windows have to be kept closed, which renders the rooms stuffy, and is a source of constant complaint from private pay patients. Also, such an addition would give more room for the diet kitchen which at present is entirely too small for proper and efficient service of patients' diets. Further, it would afford more commodious reception rooms on first and second floors for use of visitors and incoming and outgoing patients, and in the basement provide a checking room for proper care of patients' clothing and baggage.

10. *Animal house.*—There should be built, in the rear of the laboratory a separate, suitable building for an animal house. At present such animals as are used for experimental and diagnostic work at the Board of Health Laboratory are kept in rooms which are dark, and although kept as clean as possible, the odor therefrom is very objectional and permeates not only through the laboratory building itself, but also to the street. People walking the road in front of the laboratory get the odor and a great many inquiries are made as to whether the odors are due to decomposing bodies in the laboratory. Aside from these facts, in the present location the animal rooms are not a suitable place to keep animals in a healthy condition. They should be kept in a separate building, especially designed to give them sunlight, plenty of ventilation, etc., and also to reduce to a minimum an insanitary nuisance.

11. Because of the difficulty in getting hot dry steam to all parts of the hospital and laboratory, due mainly to improper location of the steam plant, it is recommended the power plant be relocated

near the road back of the Board of Health Laboratory, about the present site of the attendants' quarters, and that a laundry be built in connection with the power plant, of sufficient capacity to handle the hospital linen. While the immediate expense may be considerable, with such a plant installed it would mean an immense saving to the hospital over the present arrangement.

12. Considerable equipment requires replacements and additional items are needed; the most important ones are, beds, cribs, mattresses, pillows, blankets, desks and office equipment for clinic offices, file cases for file room, china and silverware for private rooms and white sections, bakeshop and kitchen equipment, to include ice cream freezer and apparatus for ice manufacture, a pipe-cutting machine, a new ambulance and a new body for hearse (the present body is practically rotted out and will not last very much longer).

COROZAL HOSPITAL.

(Dr. LOUIS WENDER, Superintendent.)

Corozal Hospital, for the insane, is located at Corozal, 3 miles from Panama. The hospital wards occupy an area of about 5 acres and include 10 ward buildings for the insane. The management of this hospital also includes that of the farm of 150 acres, 30 cultivated and 120 pasture, on which the hospital is located. This institution operates a piggery and a dairy, furnishing milk for hospitals, and some for the small children in the Canal Zone and for adults on physicians' prescriptions. In addition, a home for cripples injured in the service of The Panama Canal is provided and operated under the hospital management.

BUILDINGS.

There were no new buildings constructed at Corozal Hospital during this year, but a few alterations were made. The nurses' quarters were enlarged, making their rooms more spacious and adding two rooms, enabling us to accommodate our full organization of female nurses and stewardess.

Ward "F," which has been utilized for the past year as an occupational ward for the male and female patients, was enlarged to accommodate more patients. This alteration was made in November at a cost of \$1,200, which will be reimbursed by the income from articles sold from the occupational ward; already \$500 has been turned in to be credited to this construction.

The feeding platform for the piggery has been surrounded by a concrete wall in order to make it more sanitary and prevent food from slopping off the platform, thus preventing flies breeding. The platform has also been resurfaced, the work being done by the patients.

A refrigerating machine has been installed in the dairy.

The kitchen and the second story porches and roofs and part of the wards were painted during the year.

A new concrete coal bin has been built at the railroad station by the hospital help, to facilitate the handling of coal for the hospital and quarters.

HOSPITAL DEPARTMENT.

There were 384 patients the first day of the year; 170 were admitted, 32 died, and 145 were discharged or transferred, leaving 377 remaining at the end of the year. We have endeavored to deport all those who could be sent back to their homes; the total deportations for the year numbered 80 patients.

The occupational ward, which was established in the early part of 1919, has proven a great success. Nearly 40 patients are in this department making various articles, whereby they spend their time in a congenial manner which produces a beneficial effect upon their mental condition. Owing to the lack of accommodations, our occupational undertakings are scattered in various parts of the hospital grounds; however, we have succeeded in finding some sort of work to employ about 80 per cent of the female patients and 60 per cent of the males. An open, spacious, well-ventilated building where more patients could be brought during the day to be instructed, would increase the efficiency of the occupational therapy and benefit the patients to a greater extent. Over \$4,660 worth of produce was taken from the patients' garden and utilized for their own mess. Undertakings of this character do not entail any expense to the Health Department and yet are a material benefit to the patients themselves.

Broom-making machinery arrived recently and steps have been taken whereby some of the insane patients, and some of the chronics who were transferred from Ancon Hospital, will be induced to make brooms. Several chronics have already taken up this kind of work and are earning a little money in order to enable them to purchase small luxuries and other articles.

The grounds in the hospital inclosure have been kept in order by patients detailed for that purpose.

FARM DEPARTMENT.

General.—The number of cripple employees has been reduced from 50 to 29, by obtaining employment more remunerative for them than their work on the farm warranted us in paying. This, with the reorganization of the farm, has reduced its running expense to a great extent.

Dairy.—Our herd consists at present of 59 Jersey and 16 Holstein cows, 2 Jersey bulls, 1 Holstein bull, and 25 calves. With the regular arrival of feed from the United States and the pastures being in fairly good condition, we have been able to keep our regular supply of milk up to a good standard. Of the 25 Holsteins, which were imported from the United States in December, 1919, and immunized here against tick fever, 6 died as a result of the inoculation and 3 from other causes. The remaining 16 are doing well and we are at present milking 7 of them.

With the installation of the refrigerator, whereby the milk can be cooled by mechanical refrigeration, we are able to save on labor and ice approximately \$75 per month. Not only has this proven a success financially, but from a sanitary viewpoint, as the exposure and handling of the milk is reduced by one-third. We continue to pasteurize our milk after each milking as previously.

Piggery.—There was a total of 272 pigs on December 31, 1920. During the year we purchased barrows and 30 sows from the Supply Department. These sows were of native stock and in very poor condition, but after being fattened were bred and are raising quite a number of pigs. There was only one death among the young pigs from hog cholera, as all our pigs are immunized at regular intervals against this disease. We have endeavored to supply Ancon Hospital with all its pork, selling the surplus to the Cattle Industry.

Garden.—During the year a nursery was started in order to enable us to supply the Isthmus with various hedges and flowers. We have continued to raise vegetables, which are sold to the hospitals and the commissaries. The rose garden has been enlarged and we are able to supply the demands for roses from time to time.

General remarks.—The general health of the patients, cripples, and chronics remains good. With the continued increase in the number of female patients, steps will have to be taken to construct a small ward to accommodate about 25 or 30 patients, due consideration being given to separate rooms for private patients, white Americans, and others who are willing to pay the extra cost, there being at present no suitable accommodations for the latter class of patients.

COLON HOSPITAL.

(Maj. T. J. LEARY, U. S. Army, Superintendent.)

HOSPITAL WORK.

The work is going along nicely. Many demands are made that the ordinary hospital is not called upon to meet, due to the fact that this institution combines an emergency hospital with a busy dispensary service. In addition to this work, quite a few calls are made by our physicians into the town and to ships in the harbor.

BUILDINGS.

These are very satisfactory. The painting of the hospital was finished during December and it now presents a neat and pleasing appearance. Ward "A" of the old hospital group has been given a slight overhauling, and is in condition to care for isolation cases coming to us for overnight, to be transferred to Ancon Hospital the following day. The most urgent need of the hospital is an up-to-date X-ray equipment. The X-ray operator could replace one of our present force, and it would be of still greater advantage if he were competent to do gas-oxygen anesthesia and apparatus for gas-oxygen anesthesia were installed at the hospital. The addition of such equipment would be a great time and labor saver and would be more suitable for emergency work than ether anesthesia.

If any policy of expansion for Colon Hospital will be given consideration, it is believed the first addition to the present group should be a modern isolation wing. Colon will doubtless continue to grow rapidly in importance from year to year and in order to meet its growing requirements, the hospital facilities on this side should be expanded to the point of being able to hospitalize all of the sick from the Atlantic side. The principal objection to the present system is the separation of the sick from their families and friends.

SANTO TOMAS HOSPITAL (Panama).

(Maj. EDGAR A. BOCK, U. S. Army, Superintendent.)

While Santo Tomas Hospital is not entirely under the jurisdiction of The Panama Canal it is, more or less, intimately associated with the Health Department by virtue of the agreement between the Republic of Panama and The Panama Canal, dated October 17, 1905, which reads as follows:

"The affairs of Santo Tomas Hospital will be administered by a Board of Directors of five members, three of whom will be appointed by the President of the Republic of Panama and two by the Governor of the Canal Zone. Of the three directors appointed by the President, one shall be the Treasurer of the Hospital, and one the Secretary of the Board. The Chief Health Officer of the Canal Zone, thereupon, will be the President of the Board of Directors. The Superintendent, two internes, and three graduate nurses shall be appointed by the Governor of the Canal Zone and their salaries paid from the funds of the Canal Commission."

Under the provision of this agreement, Santo Tomas Hospital has continued to operate under the joint administration mentioned and under the direct supervision of the Chief Health Officer of The Panama Canal.

The year 1920 has been a particularly successful one for the hospital in many ways. The auditing and property accounting department, installed in 1919, has been perfected and enlarged with use, until it is now functioning efficiently and satisfactorily. All outstanding debts of the institution have been canceled and current monthly bills are now paid as soon as received. The revenues of the past year have amounted to \$245,414.96, while the actual operating expenses have been \$231,939.97, leaving a balance of \$13,474.99 available for use. An excess of approximately \$1,000 of revenues above expenses is now being shown monthly.

An effort has been made to improve the purchasing department of the hospital to the point where the best possible supplies and equipment can be obtained for the least expenditure of money. Waste and extravagance have been lessened and economy and thrift in every department advocated and enforced.

The buildings, many of which are very old and practically falling down, have been repaired, repainted, and rendered habitable until the construction of the new Santo Tomas Hospital shall be completed. The usual routine of repairs of furniture and equipment by hospital artisans has been accomplished. All new furniture, wooden legs, crutches, coffins, etc., are manufactured in the carpenter shops. All beds and tables have been renamed and electric and plumbing fixtures installed and repaired. In fact, all maintenance and upkeep work has been done by the hospital personnel, thereby saving an enormous expense.

Professional service.—All attention possible has been devoted to improving the professional service of the hospital and while it is still far from being ideal, it is undoubtedly advancing in efficiency. During the year, 14,584 patients have been treated; 155,593 days,

relief have been furnished, an average of 422 patients per day during the entire year. The average length of stay in hospital, for each patient was 10 days. Eight hundred fourteen deaths occurred in the hospital.

During the year, 1,960 major operations and 2,721 minor operations were performed by the surgical service. Eight hundred seventy-seven obstetrical cases were delivered. In the dental clinic, 4,756 treatments were given and 1,384 teeth extracted.

There were 8,421 cases treated by the medical service in the hospital, and 8,840 patients treated in the dispensary; 12,489 prescriptions were filled in the pharmacy of the hospital. The ambulance service which operates under this department made 1,946 calls, and the dispensary vaccinated 17,270 persons against smallpox.

During the year, 5,121 cases were examined and treated in the eye and ear clinic; 456 operations were performed; 11 refractions were made and 1,221 prescriptions furnished to patients.

A total of 1,248 cases was handled in the X-ray clinic. Three thousand one hundred twenty-six plates and 522 dental films were used and 91 treatments administered.

Marked success has been attained by the venereal clinic. During the entire year, 2,512 new cases have been admitted, of which 1,825 were men and 687 women; 18,206 treatments and 1,548 consultations have been given; 1,682 injections of salvarsan, 2,120 injections of mercury and 598 operations have been done on clinic patients. The patients treated in this clinic have been relieved as follows: Six hundred twenty-seven cured, 374 discharged improved, 221 still under treatment, and the remainder left the clinic without authority from the doctor. Of the cases treated, 321 were diagnosed as syphilis and 746 as gonorrhea. Prophylactic treatment has been given to 3,046 men. Wassermann tests have been done on 4,187 persons and of this number 26.8 per cent have been positive. The revenue derived from the clinic amounted to about \$8,000. A vigorous campaign of advertising throughout the entire city has been kept up and excellent results secured therefrom.

During the year, 251,593 rations were issued and prepared by the steward's department for the patients and personnel of the hospital. Of this number 96,000 were for the personnel and 155,593 for patients. The average cost of each ration per person per day was \$0.317. The cost of hospitalization for each patient has amounted to \$1.515 per day, including subsistence. The total cost of operating this department has been \$90,764.83.

NEW HOSPITAL SANTO TOMAS.

The work of construction of the new Santo Tomas Hospital has been pushed energetically during the entire year of 1920. This enormous project was begun on November 15, 1919. All the grading and filling, consisting of approximately 92,000 cubic yards of earth and rock, has been completed and all municipal work, including streets, water and sewer lines, and electrical conduits have been installed. Materials in form of steel, lumber, and cement, have been acquired from the United States and placed on the hospital site. The plans of all of the buildings have been completed by the drafting department. Two

buildings, the isolation and tuberculosis sections, have been practically completed with the exception of the finishing work which will not be done until all the buildings are ready for completion.

LEPER ASYLUM, PALO SECO.

(Mr. F. D. TUCKER, Superintendent.)

During the year the asylum buildings were repainted, both exterior and interior, by the patients. Trees and hedges were set out, lawns marked out and graded, and gravel connecting walks put in. The task of altering the baths and toilets of the nine quarters buildings was completed; a ventilator was built on the office-commissary building; a vegetable storeroom and a carpenter shop was put in and the fronts of two quarters were changed, doing away with the long and dangerous front steps. A new panga was built. All repairs to buildings, furniture, plumbing, etc., were made by our own labor. Grass and bush cutting and sanitary work also were kept up.

One new building was completed by outside labor and occupied during the year, to be used as a detention ward for mental and unruly cases among the patients.

Weekly moving picture exhibitions were given as usual; several dances were held and entertainments were given by some local talent, others by Girl Scouts, the Penn State Quartette, etc. National holidays were celebrated, and, thanks to the great generosity of friends on the Isthmus and in the States, our Christmas was a real one, with a tree, ice cream, cake, turkey, and presents. A small organ given by States' friends contributed greatly to the success of these times.

During the year 11 patients were admitted, 5 died, 2 were repatriated, 1 mental case was transferred to Corozal Hospital, and 6 cases, after exhaustive examinations, were discharged. Patient population December 31, 1920, was 74.

A monthly average of 30 patients were employed, the payroll averaging \$193.21 per month. The value of products purchased from the patients for the asylum for the year was \$811.02. Total cash sales at the local store, operated by the asylum, amounted to \$4,696.28.

The oral administration of chaulmoogra oil was continued this year with rather more willingness on the part of the patients, due to the fact that several cases were discharged in 1919 "apparently cured," or at least in whom there were no active lesions or bacteriological evidence of infection. A diagnostic board, consisting of the Chief of the Medical Clinic and the Chief of Laboratory of Ancon Hospital and the Assistant Chief Health Officer, which board passes on every case admitted to the asylum, met four times during the year to consider carefully those cases at the asylum whose improvement seemed to warrant their discharge. As a result of these examinations, six cases were discharged during 1920.

The Board of Health Laboratory is beginning to produce an ethyl ester of chaulmoogra oil; it is expected that in the near future there will be available for hypodermic use a sufficient amount of this derivative to enable the asylum to greatly obviate the discomfort that is caused by administration of the oil by mouth.

On December 31, of our 74 patients, 62 (83.7 per cent) were taking chaulmoogra oil by mouth. As inability to tolerate the oil is given as their objection by practically all those not accepting the treatment, it is hoped that by the improved method of administration soon to be followed it will be possible to induce every one to be treated.

BOARD OF HEALTH LABORATORY.

(Dr. L. B. BATES, Chief of Laboratory.)

(Operated in connection with Ancon Hospital.)

The work of the laboratory during the year has necessarily been largely routine. The following report has been prepared in the form of tables in so far as it was practicable to do so. The following paragraph is quoted from the rules of Ancon Hospital to show the amount and variety of work now required of the laboratory:

"The Board of Health Laboratory is the official laboratory for Ancon Hospital, Colon Hospital, Corozal Hospital, the District Physicians, the Quarantine Stations, Palo Seco Leper Colony, Health Officers of Panama and Colon, the Coroner, the Veterinary Service of the Health Department, and the Colon Free Clinic for Venereal Diseases. It also serves as a Department Laboratory for the Panama Canal Department, U. S. Army, and for the Fifteenth Naval District, U. S. Navy, when so designated by those services."

In addition, considerable work has been done for other departments, private hospitals, and private physicians.

An epidemic of influenza started on the Canal Zone about the middle of March and commenced to wane in the middle of April. A bacteriological study of the cases was commenced early in the epidemic and the results reported before the Medical Association in May, at which time about 400 cases had been studied.⁶ Nasopharyngeal cultures, sputum cultures, blood cultures and cultures from autopsy material were made whenever possible. Subsequent work has not changed the conclusions which were drawn at the time from the study of these cases. The conclusions drawn were as follows:

1. No one organism has been predominant in our cases. A variety of organisms has been recovered from lesions which were apparently the same, the appearance of the lesion being no criterion as to the organism present.

2. *Streptococcus hemolyticus* has been found in but small proportion of our cases and when found they were few in number and not widely distributed. We may safely say that the *Streptococcus hemolyticus* has played an unimportant part in this epidemic.

3. The influenza bacillus has been recovered from 15 per cent of the throats cultured during this epidemic; during an examination of 140

⁶ The paper is entitled "The Bacteriology of the Influenza Epidemic on the Canal Zone during March and April, 1920," by Dr. Lewis B. Bates, and Dr. J. H. St. John, and is being published in the 1920 Proceedings of the Medical Association of the Isthmian Canal Zone.)

throats in this hospital made in February, 1919, this organism was not recovered. The increase in positive cases seems to be about equally divided between influenza and noninfluenza patients.

4. The pneumonias in our fatal influenza cases seem to have been caused by a variety of organisms. In no instance were the lungs sterile and in most cases some of the organisms found in the upper respiratory tract were also found in the consolidated lung tissue.

5. Although diffident about offering any opinion on account of the incompleteness of our work we quote the following paragraph of Cummings⁷ as stating our views at present: "The whole clinical and pathological picture becomes intelligible if we can postulate a primary etiological agent acting locally upon the respiratory surfaces and generally through its toxic products in such a manner as to prepare the way for invasion by the prevailing respiratory flora."

During the year the pathologist reviewed sinusitis, otitis media and mastoiditis in the 3,376 autopsies which had been performed by him at this laboratory. Much valuable data is collected in this paper and the 1920 number of the Proceedings previously referred to will contain this article in full.

The entomologist prepared an article upon the Panama Canal species of the *Genus Anopheles*, bringing synonymy up to date, and treating particularly upon the taxonomy of the species and the collection and care of material for study. The article with 13 illustrations has been printed by the Health Department as a monograph, and will also appear in the Proceedings.

At various times throughout the year blood films showing malarial parasites, smears, cultures, intestinal parasites and ova and other laboratory specimens have been forwarded to medical schools requesting them.

BACTERIOLOGICAL REPORT.

Blood cultures:

Total number of blood cultures.....	405
Positive blood cultures.....	73
Organisms recovered in blood cultures:	
<i>B. typhosus</i> (25 cases).....	33
<i>B. paratyphosus</i> A.....	2
<i>B. coli</i>	2
Pneumococcus.....	15
Type I.....	3
Type II.....	2
Type III.....	4
Type IV.....	6
<i>Streptococcus viridans</i>	3
<i>Streptococcus hemolyticus</i>	6
<i>Staphylococcus</i>	12

Blood cultures made from 76 cases of influenza uncomplicated with pneumonia were all sterile; blood cultures made from 24 cases of influenza complicated with pneumonia were positive in 10 instances, the pneumococcus being recovered each time. (Type II, 2; Type III, 2; Type IV, 6.)

Blood cultures were not made routinely in cases of lobar pneumonia. Fifteen cases were cultured and the pneumococcus recovered 5 times. (Type I, 3; Type III, 2.)

⁷ Studies of Influenza in Hospitals of the British Armies in France, 1918. Introduction by Col. S. L. Cummings, C. M. G., A. M. S.

Dark field.

Dark field examinations of skin lesions.....	10
Number positive for <i>Treponema pallidum</i>	1
Number positive for <i>Treponema pertenue</i>	5
Dark field examinations of venereal ulcers.....	142
Number positive for <i>Treponema pallidum</i>	25
Number positive for <i>Treponema perfringens</i>	2

Many of the ulcers were mere abrasions. Some were too old or had received enough treatment to render the finding of the *treponema pallidum* improbable. In typical cases of chancre two or more examinations were made when possible. Two of the positive cases included in the above had the positive lesion on parts other than the genital organs. The ulcer in one case was on the lip, in the other case on the umbilicus.

Sputums.

Sputums from various sources were cultured for *B. influenzae* and *Pneumococcus*, from August to December, inclusive, this work beginning three months after the subsidence of the influenza epidemic.

Number of sputums cultured.....	74
<i>B. influenzae</i>	9
<i>Pneumococcus</i> (Type I, 1; Type II, 6; Type III, 3; Type IV, 11).....	21

Spinal Fluid Cultures.

Total number of cultures (52 cases).....	123
Positive cultures (18 cases).....	34
<i>B. influenzae</i>	1
<i>B. influenzae</i> and <i>Staphylococcus albus</i>	1
<i>B. influenzae</i> and <i>Streptococcus viridans</i>	1
<i>Meningococcus</i> (type normal).....	1
<i>Pneumococcus</i>	4
(Type I, 1; Type II, 1; Type IV, 2.)	
<i>Staphylococcus aureus</i> and <i>Pneumococcus</i> (type IV).....	1
<i>Streptococcus viridans</i>	2
<i>Streptococcus hemolyticus</i>	1
<i>Staphylococcus aureus</i>	4
<i>Streptococcus hemolyticus</i> and <i>Staphylococcus aureus</i>	1
<i>B. tuberculosis</i>	1

Autogenous vaccines prepared.....	63
Stools cultured for typhoid-dysentery group.....	1,057
Urines cultured for typhoid group.....	551
Urines cultured for other organisms.....	303

Milks:

Corozal Hospital dairy.....	243
Mindi dairy.....	211
Panama dairies (through Health Officer, Panama).....	738
Commissaries.....	2
Condensed.....	11
Panama ice cream (through Health Officer, Panama).....	11
Colon dairies (through Health Officer, Colon).....	18
Colon ice cream (through Health Officer, Colon).....	5
Commissary ice cream.....	2
Powdered milk.....	1
Miscellaneous.....	5
Naso-pharyngeal cultures.....	551
Sputum cultures.....	597
Throat cultures (Positive for <i>B. diphtheriae</i> , 66 cases, 190).....	1,939
Throat cultures (other organisms than <i>B. diphtheriae</i>).....	13
Plaques in buccal cavity.....	51
Membrane from throat.....	1
Ear cultures.....	81
Eye cultures.....	17
Ear casts.....	17

Mastoid cultures.....	4
Pus from chest.....	2
Pus from abscess.....	1
Pleural fluid cultures.....	13
Acitic fluid cultures.....	3
Fluid from knee joint.....	3
Fluid from gall bladder.....	2
Gland cultures.....	9
Conjunctival cultures.....	2
Phenol coefficient test of salvarsan and neosalvarsan.....	2
Phenol coefficient test of hycol.....	1
Autopsies cultured (heart's blood, organs, exudates, etc, 537).....	184
Source not given.....	1
Vaccination scab.....	1
Root of tooth.....	1
Maxillary sinus.....	1
Throat smears.....	95
Sputums examined for <i>B. tuberculosis</i>	143
Urines examined for <i>B. tuberculosis</i>	6
Vaginal smears.....	150
Urethral smears.....	103
Conjunctival smears.....	122
Skin lesions.....	3
Lesion on forearm.....	1
Dermatitis of fingers.....	1
Blood for embryo of <i>filaria hominis</i>	1
Coagulation time of blood.....	1
Test of typhoid vaccine.....	1
Examination of tropical ulcer.....	1
Can of oysters.....	1
Can of asparagus tips.....	1
Water cultures.....	3
Flour cultures.....	5
Meat from sandwich.....	1
Fish for culture and bacteriological count.....	1

Bacteriological report (animals).

Cattle ears (195 positive for <i>B. anthracis</i>).....	317
Hide cultured for <i>B. anthracis</i>	2
Horse ears.....	3
Hog ears.....	1
Rat glands.....	4
Gland culture.....	1
Culture from cow.....	1
Blood cultures.....	33
Autopsies cultured.....	89
Horse's hoof cultured.....	1
Urine cultured.....	1
Stool cultured.....	3
Skin scrapings from horse.....	1

Bacillus typhosus was recovered in blood culture from 25 individuals; 12 of these cases were from shipboard and 13 from the Canal Zone or the Republic of Panama. The two cases from which *Bacillus paratyphosus A.* were recovered were from shipboard; the two ships coming from Chile and Peru, respectively.

Typhoid carriers.—On December 31, 1919, two typhoid carriers, were under sanitary surveillance. One of these, a white American woman, has since returned to her home in the United States. The other, a colored laborer, is still a carrier and is still paroled under sanitary surveillance. Two additional carriers were detected during the year; one was a white American soldier who has since been transferred to the Walter Reed General Hospital, the other a colored woman who was and still is an inmate of the Corozal Hospital for the Insane.

Survey for meningococcus carriers.—A case of *Meningococcus meningitis* developed in Co. B, M. P., Fort de Lesseps, C. Z., October 8, 1920, a survey for the detection of carriers was undertaken.

Number swabbed.....	67
Number positive.....	7

Types of Meningococcus recovered.—Normal, 3; intermediate, 3; para, 1. Subsequent swabbing of these patients proved them to be but temporary carriers of the *Meningococcus*. The meningitis patient referred to above became a chronic carrier of the meningococcus and at this date is still held in isolation.

Leprosy.

Number of examinations made for leprosy.....	76
Number positive for <i>B. leprae</i> (new cases).....	18

(In addition, three old cases reexamined were positive.)

Photographs are now taken at the laboratory of all cases of leprosy as soon as a diagnosis is made. These are taken for purposes of record, also for purposes of comparison at a later date to show results obtained after a course of chaulmoogra esters or other treatment.

Anaerobic bacilli.—Anærobic bacilli of the gas gangrene group were recovered from two cases of human gas gangrene.

During the year 13,566 Wassermann tests were performed on 9,234 persons. The results of these tests are summarized in the following tables:

WASSERMANN REACTIONS DURING THE YEAR 1920.

(Based on the number of individuals examined and not on the number of tests made.)

	Positive.	Negative.	Total.	Per cent positive.
White, civil:				
Males.....	209	1,919	2,128	9.82
Females.....	13	204	217	5.99
White, soldiers, males.....	108	1,150	1,258	8.58
Total.....	330	3,273	3,603	9.15
Spanish and white natives.				
Males.....	117	607	724	16.16
Females.....	24	194	218	11.00
Total.....	141	801	942	14.19
Blacks and mulattoes:				
Males.....	770	2,458	3,228	23.85
Females.....	334	1,106	1,440	23.19
Total.....	1,104	3,564	4,668	23.65
Chinese, males and females.....	7	14	21	33.33
Grand total.....	1,582	7,652	9,234	17.13

In addition Wassermann tests were made on 358 spinal fluids from as many individuals, and of these, 72, or 20.11 per cent, were positive.

PATHOLOGICAL.

During the year 334 autopsies were performed at the Board of Health Laboratory. The causes of death were as follows:

General diseases.

Malarial fever, estivoautumnal.....	2
Scarlet fever.....	1
Influenza.....	32
Dysentery, entamebic.....	1
Dysentery, bacillary.....	4
Leprosy.....	2
Hemoglobinuric fever, unqualified.....	1
Pyemia.....	2
Septicemia.....	3
Pyemia and septicemia, pneumonococcus.....	1
Tetanus.....	2
Pellagra.....	2
Tuberculosis of the lungs.....	17
Acute miliary tuberculosis.....	9
Tuberculous meningitis.....	2
Abdominal tuberculosis.....	1
Pott's disease.....	2
Tuberculosis of bones and joints.....	1
Disseminated tuberculosis.....	23
Syphilis, tertiary.....	2
Syphilis, cerebrospinal.....	3
Syphilis, hereditary.....	2
Cancer of the stomach and liver (esophagus).....	1
Cancer of the breast.....	1
Cancer of other organs.....	4
Anemia, secondary, cause not determined.....	1
Purpura hemorrhagica.....	1
Total.....	123

Diseases of the nervous system and of the organs of the special senses.

Encephalitis.....	2
Simple meningitis.....	4
Pneumococcus meningitis.....	4
Myelitis.....	1
Cerebral hemorrhage, apoplexy.....	6
Softening of the brain.....	2
General paralysis of the insane.....	8
Dementia precox.....	1
Disease of the ears.....	2
Total.....	30

Diseases of the circulatory system.

Pericarditis.....	1
Malignant endocarditis.....	4
Organic disease of the heart.....	10
Angina pectoris.....	1
Aneurysm.....	1
Arteriosclerosis.....	2
Embolism and thrombosis.....	1
Phlebitis.....	1
Total.....	21

Diseases of the respiratory system.

Broncho-pneumonia.....	3
Lobar pneumonia.....	11
Gangrene of the lungs.....	1
Total.....	15

Diseases of the digestive system.

Follicular tonsillitis.....	1
Acute appendicitis.....	2
Intestinal obstruction.....	3
Duodenal ulcer.....	1
Cirrhosis of the liver.....	1
Biliary calculi.....	1
Total.....	9

Nonvenereal diseases of the genito-urinary system and annexa.

Chronic nephritis.....	11
Pyo-nephritis and pyelitis.....	3
Hypertrophy of the prostate gland.....	1
Salpingo-oophoritis.....	1
Total.....	16

The puerperal state.

Accidents of pregnancy.....	1
Puerperal albuminuria and convulsions.....	1
Total.....	2

Diseases of the skin and cellular tissue.

Phlegmon and cellulitis.....	2
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Diseases of the bones of the organs of locomotion.

Diseases of the bones and joints (tuberculosis excepted).....	2
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Malformations.

Congenital malformations (stillbirth not included).....	10
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Diseases of early infancy.

Premature birth.....	4
Malnutrition.....	25
Other diseases peculiar to early infancy.....	7
Total.....	36

Affections produced by external causes.

Suicide by firearms.....	1
Acute poisonings (food excepted).....	3
Burns (conflagration excepted).....	1
Accidental drowning.....	1
Traumatism by a fall.....	4
Traumatism by machines.....	2
Traumatism by railroad crushing.....	3
Traumatism by other crushings.....	5
Lightning.....	1
Electricity (lightning excepted).....	1
Homicide by firearms.....	1
Homicide by cutting instrument.....	1
Homicide by other means.....	1
Other forms of external violence.....	1
Legal execution by hanging.....	3
Total.....	29

Ill-defined diseases.

Ill-defined organic disease.....	2
Infection of undetermined origin.....	1
Total.....	3

Stillbirths and nonviable fetus.

Stillbirths (at or near full term).....	23
Nonviable fetus.....	13
Total.....	36
Grand total.....	334

The most frequent causes of death listed for the year were:

	Cases.	Per cent.
Tuberculosis.....	55	16.4
Influenza.....	32	9.5
External affections (trauma).....	29	8.6
Malnutrition.....	25	7.4
Diseases of the heart.....	16	4.7
Acute respiratory diseases.....	15	4.4
Nephritis, chronic.....	11	3.2
Congenital malformations.....	10	2.9

Table showing the more common causes of death at autopsy in the Board of Health Laboratory.

Date.	Number of autopsies per year.	Pneumonia.	Tuberculosis.	Hemoglobinuric fever, malaria.	Affections produced by external causes.	Chronic nephritis.	Combined types of dysentery.	Organic heart disease.	Typhoid.	Diarrhea and enteritis (in children).	Cancer.
1904.....	6	1	1	.....	.....	.....	.....	.....	.....	.....	.....
1905.....	269	60	9	27	3	8	5	3	9	.....	2
1906.....	509	191	22	50	24	23	39	15	33	.....	2
1907.....	496	156	35	27	40	27	36	12	58	4	4
1908.....	361	59	63	46	26	25	23	11	14	.....	7
1909.....	295	55	37	26	32	31	11	17	11	1	5
1910.....	451	50	91	52	30	37	36	16	10	6	4
1911.....	508	83	102	41	38	36	19	20	9	11	11
1912.....	425	53	79	23	37	27	15	22	6	7	11
1913.....	460	47	89	21	34	26	8	26	5	23	12
1914.....	375	36	78	6	38	12	6	27	5	14	3
1915.....	328	28	56	14	20	12	5	14	2	15	10
1916.....	323	25	81	8	17	20	7	10	6	9	7
1917.....	330	24	51	5	21	23	3	18	1	3	5
1918.....	253	38	68	6	6	12	.....	8	.....	1	5
1919.....	324	22	55	3	15	14	3	20	3	10	11
1920.....	334	^a 46	55	.....	29	11	5	16	.....	.....	6
Total.....	6,047	974	972	355	410	344	221	255	172	104	105-

^a This includes 32 cases of influenza.

Table showing number of autopsies performed revealing the following diseases per year.

Date.	Autopsies performed per year.	Yellow fever.	Beriberi.	Ankylostomiasis.	Tetanus.	Infectious diseases of children.	Plague.	Smallpox.
1904	6							
1905	269	12	7	7	2		1	
1906	509	1	5	4				
1907	496		1	2	1			
1908	361		1	2	3			
1909	295	2					1	
1910	451	2						
1911	508		1	1	1		1	
1912	425	1			1	4		
1913	460			2	3	1		
1914	375		1		4	2		
1915	328	3	1		2	1		
1916	323		2			3		1
1917	330		7		1	2		
1918	253			2		3		
1919	324	2				3		
1920	334					⁹ 1		
Total	6,047	23	26	20	18	20	3	1

⁹ Scarlet fever.

Four hundred seventy-three bodies passed through the laboratory during the year 1920; of these 9 had been autopsied at Colon Hospital, of the remaining 464, 334, or 71.9 per cent, were autopsied at this laboratory, 28.1 per cent were not autopsied.

MALARIAL CARRIERS FOUND AT AUTOPSY (EXCLUDING 2 CASES DYING OF MALARIA).

Cases.		Cases.	
January	4	August	3
February	1	September	2
March	3	October	2
April	3	November	5
May	1	December	3
June	6		
July	2	Total	35

Three hundred thirty-four autopsies minus 2 deaths from malaria show 35 out of 332 autopsies revealing pigment and parasites in scant manner in rib marrow and spleen films or a per cent of 10.5.

Their local residences were as follows:

Colon	14	Balboa	1
Gatun	1	Panama City (suburbs)	4
Chagres River village	1	Cattle Industry pastures	8
Culebra	1	Peruvian sailor	1
Corozal	3	Fort Clayton	1

Microscopic examinations and reports on surgical specimens.

Tonsils (pairs).....	262
Tonsils (pairs) and adenoids.....	172
Adenoids.....	34
Specimens from eyes and eyelids.....	22
Specimens from nose (nares).....	98
Specimens from nose (cutaneous).....	9
Specimens from external auditory canals.....	19
Specimens from skin of face (nose excepted).....	15
Specimens from oral cavity (tonsils and adenoids excepted).....	10
Specimens from skin of back.....	5
Specimens from skin of buttocks.....	2
Specimens from skin of external genitalia.....	11
Specimens from perineum and anus.....	6
Specimens from skin of upper extremities.....	13
Specimens from skin of lower extremities.....	7
Specimens from skin of chest and abdomen.....	3
Appendix.....	174
Specimens from intestines.....	6
Specimens from rectum.....	14
Specimens from stomach.....	2
Specimens from larynx and trachea.....	2
Carotid body.....	1
Thyroid gland.....	13
Specimen from brain.....	1
Salivary glands.....	2
Uterus and appendages.....	51
Cervix uteri.....	11
Tubes and ovaries.....	42
Specimens passed from or taken from uterine cavity.....	18
Spermatic cord.....	2
Epididymis.....	4
Testes.....	5
Kidneys.....	2
Bladder, specimens from.....	2
Prostate glands.....	4
Mammary glands.....	12
Gall bladder.....	7
Omentum, specimens from.....	3
Muscles, specimens from.....	3
Tendons, specimens from.....	1
Amputated lower extremities.....	4
Amputated upper extremities.....	1
Nerve, ulnar.....	1
Joints, specimens from.....	2
Bones, specimens from.....	3
Artery, aneurysm of.....	1
Lymph nodes, cervical.....	16
Lymph nodes, supraclavicular.....	1
Lymph nodes, submaxillary.....	1
Lymph nodes, axillary.....	4
Lymph nodes, epitrochlear.....	3
Lymph nodes, inguinal and femoral.....	7
Lymph nodes, retroperitoneal.....	1
Lymph nodes, meso-appendiceal.....	1
Lymph nodes, location unknown.....	1
Colon Hospital autopsy sets of tissues.....	43
Total.....	1,160

PRINCIPAL LESIONS ENCOUNTERED IN SURGICAL SPECIMENS OTHER THAN
INFLAMMATORY.

Malignant tumors (repeated specimens same case excluded).

Uterus.....	5
Breast.....	5
Nose.....	6
Rectum.....	3

Malignant tumors—Continued.

Bladder and prostate.....	2
Lower lip.....	3
The nares.....	2
Scalp and cheek.....	1
Face.....	2
Stomach.....	1
Penis.....	1
Larynx.....	1
Eyelids.....	1
Floors of mouth and tongue.....	1
Scrotum and perineum.....	1
Vagina and inguinal glands.....	1
Back of hand.....	1
Omentum (primary growth unknown).....	1
Tube and ovary.....	1
Leg.....	1
Ovary.....	1
Lower maxilla.....	1
Carotid body with metastases.....	1
Total.....	44

Benign tumors.

Fibro-adenoma of breast.....	4
Intracanalicular adeno-fibroma of breast.....	3
Mixed tumor of parotid gland.....	4
Psamomma of the brain.....	1
Osteo-chondroma of a rib.....	1
Lipoma of the back.....	1
Epulis, upper jaw.....	1
Fibro-mymato-uteri.....	22
Dermoid cyst of the ovary.....	3
Cystadenoma of the ovary.....	1
Simple cysts of the ovary.....	11
Cystic thyroid glands.....	7
Exophthalmic goiter.....	1
Hemangioma of the lip.....	1
Fibro-hemangioma of the chest.....	1
Sublingual cyst.....	1
Fibromata of the skin.....	4
Sebaceous cysts in wall of abdomen.....	1
Sebaceous cysts of face.....	1
Rectal polyp.....	1
Nasal polyp.....	12
Polyp of the endometrium.....	2
Pigmented papilloma of the back.....	1
Papilloma of the face.....	3
Papilloma of the hand.....	2
Papilloma of the tonsils.....	2
Papilloma of the lip.....	1
Papilloma of the tongue.....	1
Papilloma of the external auditory canal.....	1
Total.....	93

Specimens showing tubercu'osis.

Epididymis.....	3
Testicle.....	1
Bladder and prostate.....	1
Sinus in perineum.....	1
Sinus in scrotum.....	1
Fallopian tube.....	2
Abcess of the buttock.....	1
Abcess of thigh.....	1

Specimens showing tuberculosis—Continued.

Appendix.....	5
Omentum.....	1
Tongue (ulcer at root).....	1
Tendon sheath.....	1
Skin of the neck.....	1
Tonsils (pairs) and adenoids.....	3
Adenoid.....	1
Lymph nodes, cervical.....	10
Lymph nodes, supraclavicular.....	1
Lymph nodes, axillary.....	2
Lymph nodes, epitrochlear.....	2
Lymph nodes, unknown location.....	1
Total.....	40

Other infrequent lesions encountered.

Leprosy.....	7
Sole of foot.....	1
Palm ulcer.....	1
Ulnar nerve.....	1
Skin nodule.....	1
Foot and leg amputated.....	1
Nasal septum.....	1
Pterygium.....	1
Otomycosis (casts from external auditory canal).....	17
Dermatomycosis.....	2
Mycosis of an inguinal lymph node.....	1
Hodgkin's disease.....	2
Filariasis of epididymis and lymph node.....	1
Filariasis of an inguinal lymph node.....	1
Gas gangrene, amputated leg.....	1
Ainhum.....	1
Jigger infestation sole of foot.....	1
Gauze sponge encapsulated in pelvis 14 years.....	1
Umbilical chancre.....	1
Intussusception.....	1
Congenital cyst of the trachea.....	1
Congenital cystic kidney.....	1
Ectopic pregnancy (two at full term in broad ligament and tube).....	6
Duodenal ulcers.....	2
Appendices filled with oxyuris vermicularis parasites.....	5
Total.....	52

A review of the meningitis autopsy records during the years 1907 to 1920, inclusive was made and the following table was compiled. Bacteriological examinations were conducted at autopsy. Agglutination of the recovered organisms was carried out but no typing done.

Pneumococcus meningitis.....	66
(This excludes pneumococcus meningitis which occurred as a lesion in pneumococcus septicemia or pyemia.)	
Simple meningitis (<i>streptococcus</i> , <i>staphylococcus</i> , etc.).....	56
(This also excludes septicemia and pyemia of these natures associated with meningitis.)	
Tuberculous meningitis.....	30
(This excludes cases of disseminated tuberculosis in which the meninges revealed a lesion.)	
Cerebrospinal fever (epidemic form).....	11
(This excludes one case which died long after an attack of meningitis in which the only lesions found were meningococcic arthritis—shoulder and hip abscesses.)	
Influenzal meningitis.....	3

The following table shows how scattered in time these cases appeared:

Autopsy No.	Date admitted.	Race.	Age.	Local residence.
			<i>Years</i>	
1295	December 25, 1907...	Martinique negro...	22	Gatun, C. Z.
1804	September 10, 1909...	Martinique negro...	25	Gatun, C. Z.
1815	September 20, 1909...	Colombian negro...	30	Gatun, C. Z.
3760	December 15, 1913...	Jamaican.....	11	Panama City.
3766	December 23, 1913...	Mexican.....	24	S. S. <i>City of Para</i> , Balboa Harbor
3919	April 10, 1914.....	Jamaican.....	26	Paraiso, C. Z.
4941	May 22, 1917.....	American.....		S. S. <i>Huntington</i> , Balboa Harbor.
5052	August 31, 1917.....	West Indian negro...	1½	Panama City.
5244	May 28, 1918.....	Japanese.....		S. S. <i>Anjo Maru</i> , Balboa Harbor.
5377	November 25, 1918...	West Indian negro...	27	Panama City.
5446	February 20, 1919....	West Indian negro...	30	Panama City.

Animals (wild and domestic), autopsies:

Cattle.....	35
Calves.....	18
Hogs.....	11
Horses.....	5
Dogs.....	23
Goats.....	2
Cat.....	1
Chickens.....	3
Guinea pigs.....	34
Rabbits.....	7
Deer.....	15
Monkeys.....	2
Iguana.....	1
Porcupine.....	1
Pigeon.....	1
Saura (native opossum).....	1
Fish.....	1
Total.....	161

Animals (wild and domestic), examination:

Tissue specimens from cattle.....	7
Tissue specimens from hogs.....	4
Tissue specimens from dogs.....	3
Blood films from cattle.....	640
Blood films from deer.....	57
Blood films from dog.....	41
Blood films from iguana.....	8
Blood films from horse.....	6
Blood films from porcupine.....	1
Hemoglobin tests on cattle.....	49
Hemoglobin tests on dogs.....	28
Brain films from cattle.....	33
Dog stools.....	43
Dog urine.....	5
Total.....	929

The principal diseases encountered that were important among domestic animals were as follows:

Anthrax (cattle).
 Piroplasmosis (cattle, horse, dog, deer.)
 Hog cholera.
 Tuberculosis (dairy cattle and hogs).
 Umbilical infections (calves).
 Myiasis (screw-worm infections of hide sores and umbilicus).
 Poisoning by cattle dip contaminations.
 Oesophagostomiasis nodularis (goats).
 Uncinariasis (chiefly dogs and young calves).
Bacillus paratyphosus B. (Guinea pigs).
 Gas bacillus septicemia (three hogs).
 Actinomycosis (one calf).

Rats and mice examined.....	17,080
<i>Mus musculus</i>	10,326
<i>Mus alexandrinus</i>	725
<i>Mus norvegicus</i>	2,508
<i>Mus rattus</i>	3,521

Animal experimentation.

Biting experiments with the deer and cattle ticks. Both types developed on either animal as a host. Deer piroplasmosis was given to a calf and cattle piroplasmosis was given a fawn raised in captivity. In each case the infections were light as shown by blood film examinations. Work is to be continued.

General miscellaneous examinations, human:

Films taken from the maternal surface of placentae (8 were positive for malaria, 2.8 per cent).....	284
Blood films examined for malaria.....	922
Stools.....	3
Urine.....	3
Films from ulcer on wrist (Oriental sore).....	1
Films from nasal passages.....	1
Films from ulcer in palate of mouth.....	1
Cigarette tobacco molds.....	1
External descriptions of bodies not autopsied.....	5
Feces examined for parasites and ova.....	101

Microscopic slides prepared:

Surgical preparations.....	6,140
Autopsy preparations.....	4,404
Animal tissue preparations.....	1,608
Total.....	12,152
Paraffin preparations.....	12,034
Frozen preparations.....	118
Total.....	12,152

CHEMICAL DEPARTMENT.

Arsenical cattle dip.....	9
Acetone.....	2
Alcohol.....	1
Alkaloids, for identification.....	3
Anthrax serum, phenol content.....	1

CHEMICAL DEPARTMENT—continued.

Beverages:		
For preservatives	1	
For alcohol content	14	
For denaturants	5	
Cotton	1	
Bloods examined	176	
Nonprotein nitrogen	140	
Urea nitrogen	156	
Urea	156	
Uric acid	142	
Creatinin	142	
Glucose	134	
Cholesterin	11	
Carbon dioxide	6	
Calcium	1	
Bread	3	
Bullet	1	
Butter	5	
Cream	1	
Crude carbolic acid	4	
Calibration of clinical thermometers	1,000	
Cocoa, powdered glass	1	
Clay	2	
Clay, for arsenic	1	
Caterpillars, for arsenic	3	
Coconut meal	3	
Calf meal	2	
Cigarettes	1	
Cognac	1	
Drug, narcotics	1	
Eggs	1	
Fluid, for arsenic	1	
Feed, for arsenic	1	
Flour	5	
Hide, for arsenic	9	
Hide scrapings, for arsenic	1	
Gastric analyses	31	
Gasoline	6	
Hydrogen, peroxide	1	
Hominy, lye	1	
Iron ore	1	
Ice cream	27	
Kerosene	1	
Lard substitute	1	
Matches, safety	21	
Milks, dairy, food value	184	
Milks, dairy, for preservatives	3	
Milks, condensed	7	
Milks, evaporated	2	
Milks, mothers'	25	
Milks, powdered	1	
Mahogany filler	1	
Mineral	1	
Oil, Diesel	2	
Oil, castor	1	
Oil, fuel	2	
Opium, for identification	3	
Oleomargarine	24	
Oysters, canned, lot	1	
Oysters, fresh, lot	1	
Potatoes	1	
Powder, vegetable	1	
Rice	3	
Rosin	1	
Spinal fluids, for arsenic	5	
Spinal fluids:		
Colloidal gold	294	
Butyric acid	288	
Ammonium sulphate	288	
Phenol	289	

CHEMICAL DEPARTMENT—Continued.

Stomach of cow, arsenic.....	1
Stomach contents of horse, phenols.....	1
Silk.....	1
Sugar, percentage of sucrose.....	9
Sugar cane.....	1
Soil, for arsenic.....	2
Toxicological examinations.....	7
Umber.....	1
Urine examinations.....	106
Routine.....	64
Arsenic.....	1
Urea.....	4
Urea nitrogen.....	5
Acetone bodies.....	11
Glucose.....	21
Nitrogen partition.....	2
Lead.....	11
Mercury.....	1
Calcium.....	1
Renal function.....	3
Urine, bovine, for arsenic.....	4
Vinegar.....	1
Vomitus.....	1
Water, complete analysis.....	1
Water, for arsenic.....	3
Washings from milk bottle.....	1

The work of the chemical laboratory during the year 1920 has consisted mostly of routine analytical work, which is given in the above tabulated form.

The working out of a method for the utilization of two shipments of crude carbolic acid received at the larvicide plant consumed considerable time. While conforming to specifications as to "tar acid" content and specific gravity, these two shipments differed from the crude carbolic acid received heretofore in some manner yet not thoroughly understood, and were not capable of being worked into a satisfactory larvicide by the method which has been in use at the larvicide plant for several years. In all our previous experience with the manufacture of larvicide no crude carbolic acid similar to these two shipments has been received, and no trouble has ever before been experienced in the manufacture of larvicide. After considerable experimental work in the laboratory it was found that sulfonation of the crude carbolic acid by treatment with concentrated sulphuric acid and heat would so alter its deportment in the usual process of manufacture as to produce a satisfactory larvicide. This method was tried at the larvicide plant on a larger scale and found to produce a good larvicide. The whole of the two shipments of crude carbolic acid were made into larvicide with this additional treatment. The following shipments of acid have been of the same grade as was received previous to the two unsatisfactory lots, so that it has not been necessary to use the sulfonation process recently.

An intensive study, from the laboratory standpoint, of the colloidal gold reaction with spinal fluids has been carried on during the greater portion of the year, with special attention to the preparation of the colloidal gold. This work will be carried on during the coming year, as in the past, in connection with the routine performance of the colloidal gold reaction.

The preparation of the ethyl esters of the fatty acids of chaulmoogra oil has been started and about 700 grams prepared to date.

Sufficient experimental work has been done to place the production of the esters on a safe working basis, and the preparation in sufficient quantities for use at the leper colony has been commenced.

PHOTOGRAPHY.

A considerable number of photographs were taken at the laboratory during the year. These represented a variety of medical, surgical, dermatological, pathological, and entomological subjects. A number of miscellaneous objects of a medico-legal character, or other material in cases where photographs were desired as part of a permanent record were photographed.

ENTOMOLOGICAL REPORT.

In the entomological department work was carried on in practically all branches of entomology throughout the year, and insects belonging to the various orders examined and classified. Investigations on various problems in connection with medical, agricultural, and general entomology were conducted.

The examination and classification of adult mosquitoes collected in habitations was continued throughout the year. A large percentage of the specimens received consisted of adults taken in the daily hand catches in married quarters, military posts, camps, etc., in the Zone. Camps outside the Zone, such as the U. S. Army camp at David, R. P., and field camps at other points, also sent in catches of adult mosquitoes for identification at frequent intervals. This was of considerable value in establishing an index to the various types present at the camps and in determining the prevalence of species concerned with the transmission of disease. Specimens collected on board ships, shortly after their arrival from ports where mosquito-borne diseases were potentially present, were also received from time to time.

A considerable number of lots of mosquito larvæ were received from various points in the Zone and the cities of Colon and Panama, for identification during the year. The value of this work in indicating the types and prevalence of mosquitoes breeding in the different areas is quite apparent. More especially is this important at points where no hand catches of adults are being made.

The following table shows the number of species of adult mosquitoes and larvae classified during the year:

	Adults.	Lots of larvae.
Culicini:		
<i>Anopheles albimanus</i>	6,023	22
<i>Anopheles tarsimaculata</i>	4,613	15
<i>Anopheles pseudopunctipennis</i>	469	8
<i>Anopheles punctimacula</i>	111	2
<i>Anopheles apicimacula</i>	31	6
<i>Anopheles argyritarsis</i>	4	5
<i>Anopheles ciseni</i>	2	3
Total number of anopheles.....	11,253	59

	Adults.	Lots of larvae.
Culicini—Continued:		
<i>Aedes calopus</i>	497	492
<i>Aedes taeniorhynchus</i>	2,330	10
<i>Mansonia titillans</i>	1,684	1
<i>Mansonia nigricans</i>	15	
<i>Mansonia fasciatus</i>	10	
<i>Aedeomyia squamipennis</i>	5	1
<i>Culex quinquefasciatus</i>	5,719	152
<i>Culex coronator</i>	4	34
<i>Culex corniger</i>		20
<i>Culex proximus</i>		6
<i>Culex factor</i>		5
<i>Culex equivocator</i>		5
<i>Culex leprincei</i>		4
<i>Culex elevator</i>		2
<i>Culex jubulator</i>		2
<i>Culex revelator</i>		2
<i>Culex declarator</i>		1
<i>Culex extricator</i>		1
<i>Culex reflector</i>		1
<i>Culex chrysonotum</i>		1
<i>Culex</i> spp.....	4,012	71
<i>Psorophora lutzii</i>	47	
<i>Uranotaenia geometrica</i>		1
<i>Haemogogus, lutzii, deinocerites, etc.</i>	81	4
Total culicini minus anopheles.....	14,404	817
Sabethini:		
<i>Wyeomyia, etc.</i>	353	3
Total of mosquitos identified.....	26,010	879

During the period extending from March to December, inclusive, there were 1,274 separate lots of adult mosquitoes received for identification. No records were kept of the number of lots received during January and February.

Nearly all of the mosquito larvæ came from Panama City and Colon and when it is considered that practically each lot meant a breeding place it speaks very well for the vigilance of the Health Department of Panama and Colon in locating so large a number. It also indicates that, even after nearly 16 years of American sanitation, it is quite probable that a considerable amount of mosquito breeding would occur in the city if the American regulations were relaxed or the sanitary inspectors removed. The large percentage of larvæ as shown in the above table being those of the yellow fever mosquito, *Aedes calopus* Miegen, emphasizes the necessity for constant vigilance in controlling mosquito-breeding and the maintaining of close quarantine restrictions.

The entomologists made a number of inspection trips of various kinds to different points in the Zone throughout the year. Among these inspections were included: Juan Mina citrus grove to observe insects of economic importance; Farfan Camp to investigate mosquito-breeding; Corozal for examination of Larro cattle feed; Paraiso, Darien, and other points on the line to observe mosquito flights; Corozal Hospital to determine if fleas were infesting the wards, and many other investigations of various kinds.

Identifications were made of many ticks, fleas, lice, flies, fly larvæ causing myiasis in man and in animals, termites, beetles, scale insects, etc.

Life history and control studies were conducted on the papaya fruit fly, *Toxotrypana curvicauda* Gerst, and the spiny citrus white fly, *Aleurocanthus woglumi* Ashby.

Reports were made on the control of the Banyan Thrips (Cuban Laurel Thrips); the Fall Army worm; and various insects attacking trees and foliage in Ancon Hospital grounds.

A survey and identification of the fleas found infesting the different species of rats in the Canal Zone and Panama is being made.

Observations on certain phases of the bionomics of the yellow fever mosquito, *Aedes calopus* Miegen, are being conducted.

UNDERTAKING DEPARTMENT.

In October an addition of one room was built onto the laboratory. This room is approximately 14 by 24 feet and occupies the space between the main laboratory building and the crematory building. This room provides space for the sealing, crating, and temporary storing of embalmed bodies, free access to the refrigerator, and is also used as a general utility room by the undertaker.

Number of bodies received (5 disinterred).....	473
Number of bodies embalmed.....	71
Number of bodies cremated.....	168
Number of bodies buried on Isthmus.....	252
Number of bodies shipped.....	50

ADMISSION RATE PER 1,000 EMPLOYEES.

HOSPITALS AND QUARTERS.

ALL CAUSES.

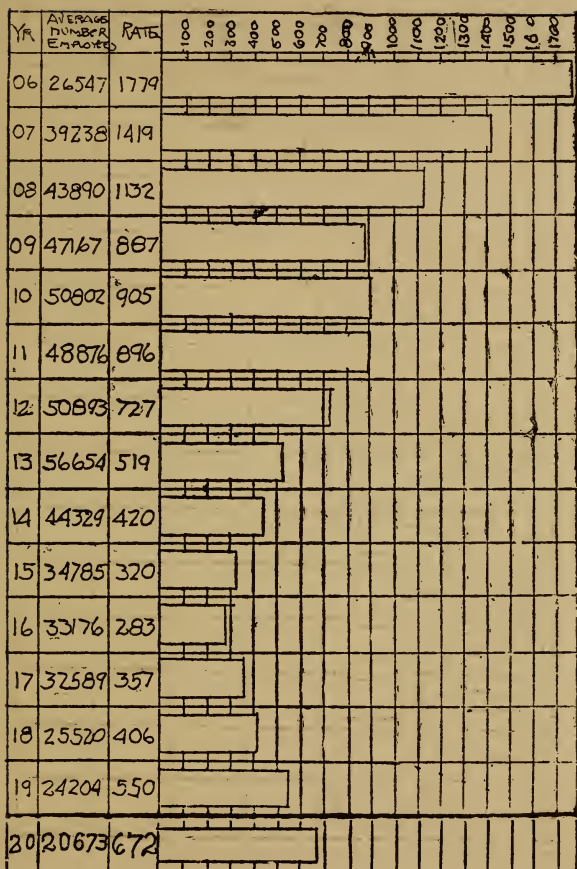


CHART No. 1.

DEATH RATE PER 1,000 EMPLOYEES.

ALL CAUSES.

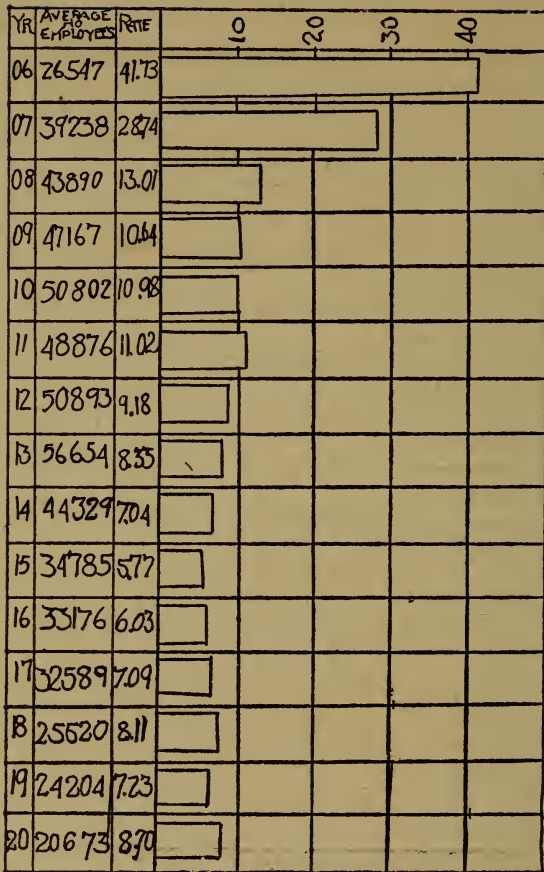


CHART No. 2.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

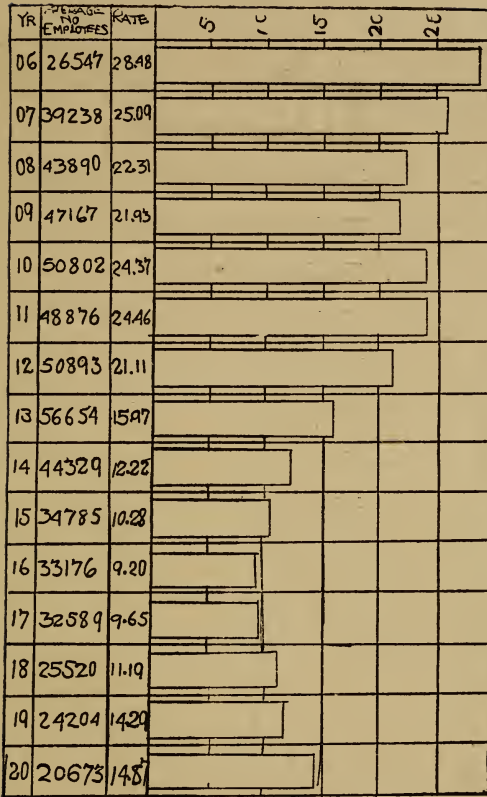


CHART No. 3.

MALARIAL FEVER.

ADMISSION RATE PER 1,000 EMPLOYEES.

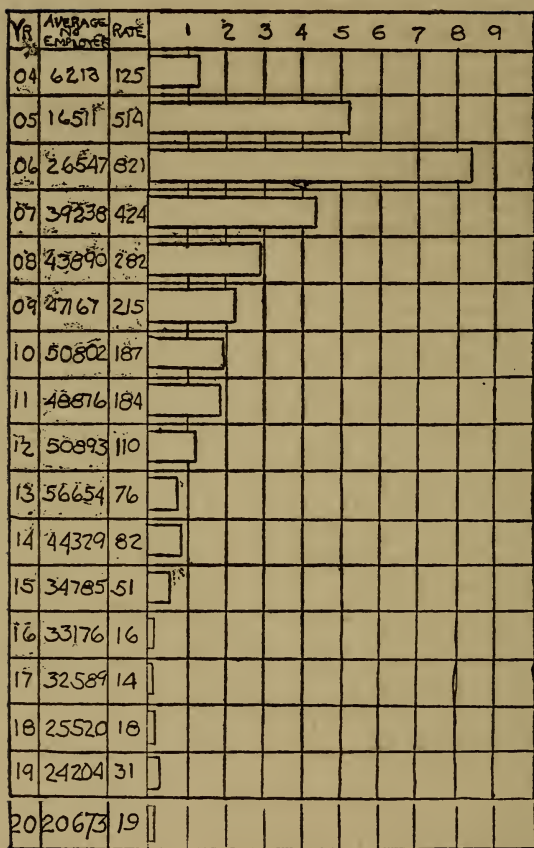


CHART No. 4.

MALARIAL FEVER.

DEATH RATE PER 1,000 EMPLOYEES.

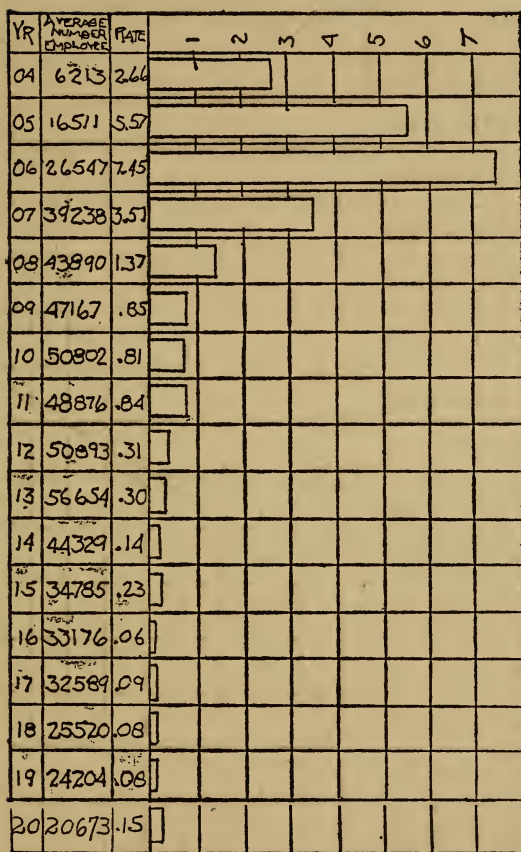


CHART NO. 5.

MALARIAL FEVER.

DEATH RATE PER 1,000 POPULATION IN THE CANAL ZONE
AND THE CITIES OF PANAMA AND COLON.

EMPLOYEES AND NONEMPLOYEES.

YR.	POPULATION	RATE	1	2	3	4	5	6	7	8	9
06	73264	9.49									
07	102133	5.37									
08	120097	3.36									
09	135180	2.07									
10	151591	1.89									
11	156936	1.82									
12	146510	1.64									
13	129104	1.32									
14	123592	1.27									
15	121650	.51									
16	116918	.21									
17	114003	.18									
18	109737	.18									
19	113958	.16									
20	114047	.08									

CHART No. 6.

TABLE I.—DISCHARGES FROM HOSPITALS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES.

ABSOLUTE NUMBERS.

	Average number of employees.	Discharges from hospitals and deaths.			Deaths.			Noneffective from sickness.	
		Total.	Diseases.	External causes.	Total.	Diseases.	External causes.	Days treated.	Constantly noneffective.
Year, 1920:									
White.....	4,688	1,393	1,252	141	22	17	5	31,775	86.81
Colored.....	15,985	3,183	2,550	633	158	136	22	80,760	220.65
Total.....	20,673	4,576	3,802	774	180	153	27	112,535	307.46
Year, 1919:									
White.....	4,523	1,271	1,141	130	10	8	2	27,338	74.90
Colored.....	19,681	3,834	3,121	713	165	142	23	98,891	270.93
Total.....	24,204	5,105	4,262	843	175	150	25	126,229	345.83

PROPORTIONATE NUMBERS.¹⁰

Year, 1920:									
White.....	4,688	297.14	267.06	30.08	4.69	3.63	1.06	.....	18.52
Colored.....	15,985	199.12	159.53	39.59	9.88	8.51	1.37	.....	13.80
Total.....	20,673	221.35	183.91	37.44	8.70	7.40	1.30	.....	14.87
Year, 1919:									
White.....	4,523	281.01	252.27	28.79	2.21	1.77	0.44	.....	16.55
Colored.....	19,681	194.81	158.58	36.23	8.38	7.21	1.17	.....	13.77
Total.....	24,204	210.92	176.09	34.83	7.23	6.20	1.03	.....	14.29

¹⁰ Annual average per 1,000 employees.

TABLE II.—CAUSES OF DEATHS OF EMPLOYEES BY COLOR,

Cause of death.	Color.		Age (in years).					
	W.	B.	15-20	21-25	26-30	31-35	36-40	41-45
Typhoid fever.....		3	1					2
Malarial fever, estivoautumnal.....	3							1
Influenza.....	2	19	2	5	6	3	2	1
Dysentery, entamebic.....		1						
Tetanus.....		1						
Pellagra.....		1				1		
Tuberculosis of the lungs.....	19		1	3	1	9	2	3
Abdominal tuberculosis.....		1						1
Pott's disease.....		2			1	1		
Disseminated tuberculosis.....		8		1	2	1	4	
Syphilis, tertiary.....		4			1	1		
Cancer and other malignant tumors of the stomach and liver.....	1							
Cancer and other malignant tumors of the peritoneum, intestines, rectum.....	1							
Cancer and other malignant tumors of other organs and of organs not specified.....		2				1		1
Purpura hemorrhagica.....		1			1			
Encephalitis.....		2						1
Pneumococcus meningitis.....		2		1			1	
Cerebral hemorrhage, apoplexy.....	1	5						1
Softening of brain.....	1	1						
General paralysis of the insane.....		2				1	1	
Malignant endocarditis.....		1				1		
Organic diseases of the heart.....		11		1	2	2	2	2
Aneurysm.....		3					2	
Arteriosclerosis.....		2						
Embolism thrombosis.....	1							1
Acute bronchitis.....		1						
Broncho-pneumonia.....		11		3	4		2	
Pneumonia (unqualified).....		2				1		1
Lobar pneumonia.....	1	8		2	2	2	1	1
Gangrene of the lungs.....		1		1				
Other diseases of the respiratory system.....		1						1
Ulcer of stomach.....		1			1			
Acute gastritis.....		1					1	
Acute appendicitis.....	1	1					1	
Inguinal hernia.....		2						1
Other hernias.....	1							
Intestinal obstruction.....		1		1				
Duodenal ulcer.....		1						
Cirrhosis of the liver.....	1				1			
Bright's disease.....	2	11			2	1	1	5
Salpingitis and other diseases of the female genital organs.....		1		1				
Phlegmon and cellulitis.....		1		1				
Diseases of the bones.....		1					1	
Suicide by firearms.....		1			1			
Acute poisonings.....		1				1		
Burns.....		1					1	
Accidental drowning.....	1	6	1	1	1	1	1	1
Traumatism by cutting or piercing instruments.....		1						1
Traumatism by fall.....	1	2						1
Traumatism by machines.....		1	1					
Traumatism by other crushings.....	2	3		1	1	1	1	1
Railroad traumatism.....		3				2		1
Electricity.....		1			1			
Homicide by cutting or piercing instruments.....	1	1				1	1	
Other external violence.....		1				1		
Cause of death not specified or ill-defined.....	1				1			
Total.....	22	158	6	22	29	33	25	28

TABLE III.—DEATHS OF RESIDENTS, AND DEATH RATES, OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Average population.	Deaths.			Annual rate per 1,000 population.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year, 1920:							
Panama.....	60,500	1,297	1,246	51	21.44	20.60	0.84
Colon.....	26,078	554	517	37	21.24	19.82	1.42
Canal Zone.....	27,459	242	211	31	8.81	7.68	1.13
Total.....	114,037	2,093	1,974	119	18.35	17.31	1.04
Year, 1919:							
Panama.....	61,369	1,211	1,165	46	19.73	18.98	.75
Colon.....	26,078	573	536	37	21.97	20.55	1.41
Canal Zone.....	26,511	229	207	22	8.64	7.81	.83
Total.....	113,958	2,013	1,908	105	17.66	16.74	.92

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
<i>General diseases.</i>									
Typhoid fever.....	3	1		4					1
Paratyphoid fever.....	1	1		2					
Malarial fever, estivoautumal.....	7	2	6	3			2	2	
Measles.....		1		1		1			
Scarlet fever.....		1		1			1		
Whooping cough.....		2		2		2			
Diphtheria and croup.....	5	2		7		1	4	2	
Influenza.....	39	23	10	52		6	5	1	5
Dysentery.....	1			1					
Entamebic.....	4		1	3			1		
Bacillary.....	4			4		3	1		
Unclassified.....		1		1			1		
Leprosy.....	4	2	1	5					1
Mumps.....	1			1			1		
Hemoglobinuric fever, unqualified.....		1		1					
Purulent infection and septicemia.....	3	2		4	1				
Pyemia.....	1	1	1	1		1		1	
Septicemia.....	5	4	2	7			2		1
Pyemia and septicemia, pneumococci.....	1	1		2					
Tetanus.....	2	1		3				1	
Pellagra.....	1	6	1	6					1
Beriberi.....	1			1					
Tuberculosis of the lungs.....	140	122	21	232	9	5	6	3	23
Acute military tuberculosis.....	5	10	2	13		3	9	1	
Tuberculous meningitis.....	4	5	3	5	1	1	6	1	1
Abdominal tuberculosis.....	3			3			1	1	
Pott's disease.....	3			3				1	
White swellings: Tuberculosis of bones and joints.....	1			1					1
Tuberculosis of other organs.....	1			1					
Tuberculosis of the larynx.....	1	1	1	1					1
Tuberculosis of the lymph glands.....	1			1					1
Tuberculosis of the genito-urinary organs.....	2	1		3					
Disseminated tuberculosis.....	29	14		42	1	3	7	3	4
Rickets.....		1		1			1		
Syphilis, tertiary.....	10	4		14					1
Syphilis, hereditary.....	8	1	3	6		9			
Syphilis, period not stated.....	3	1		3	1				
Cancer and other malignant tumors of the buccal cavity.....	3	3	2	4					
Cancer and other malignant tumors of the stomach, liver, esophagus, and pharynx.....	8	5	2	11					
Cancer and other malignant tumors of the peritoneum, intestines, rectum.....	3		2	1					
Cancer and other malignant tumors of the female genital organs.....		12		12					2
Cancer and other malignant tumors of the breast.....		1		1					
Cancer and other malignant tumors of the skin.....	1		1						
Cancer and other malignant tumors of other organs and of organs not specified.....	16	5	4	16	1				1

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
<i>General diseases.—Continued.</i>									
Other tumors (tumors of the female genital organs excepted).....		1		2				1	
Acute articular rheumatism.....	1				1				
Chronic rheumatism and gout.....	2	1		3					1
Scurvy.....	1			1			1		
Diabetes.....	1	1	1	1					
Addison's disease.....		1		1					1
Anemia, chlorosis.....	1	1		2					
Anemia, primary, pernicious.....		1		1					
Anemia, secondary, cause not determined.....		2		2			2		
Other general diseases.....		1		1					
Purpura hemorrhagica.....	1			1					
Alcoholism, acute.....	1	1		2					
Alcoholism, chronic.....	4		2	2					
<i>Diseases of the nervous system and of the organs of special sense.</i>									
Encephalitis.....	4	2		6		1	1		1
Simple meningitis.....	11	5	6	9	1	7	3	2	1
Cerebrospinal fever.....	2	3	1	4		1			3
Pneumococcus meningitis.....	7	4	1	10		3	2		1
Locomotor ataxia.....	1		1						
Other diseases of the spinal cord.....	3			3					
Cerebral hemorrhage, apoplexy.....	23	29	14	38		1			1
Softening of the brain.....	2	1	2	1					
Paralysis without specified cause.....	1	2	2	1			1		
General paralysis of the insane.....	9	1	5	5					1
Other forms of mental alienation.....	1		1						
Dementia precox.....	1		1						
Epilepsy.....	1	1		2		1			
Convulsions of infants (under 5 years of age).....	2	4	2	4		3	3		
Neuritis.....		1		1					1
Tumor of the brain.....	1			1					
Diseases of the ears.....	2			2		1	1		
Otitis media.....	4	2		6		2	4		
<i>Diseases of the circulatory system.</i>									
Pericarditis.....	2	5	1	6		1	1	1	
Acute endocarditis.....	6	4	1	9		2		3	
Malignant endocarditis.....	4	2		6		1	1		1
Organic diseases of the heart.....	43	31	7	68	4			1	7
Angina pectoris.....		1	1						
Diseases of the arteries, atheroma, etc.	2			2					
Aneurysm.....	15	2	2	15					
Arteriosclerosis.....	14	12	3	22	1				
Embolism and thrombosis.....	2		1	1					
Phlebitis.....	1			1		1			
Diseases of the lymphatic system (lymphangitis, etc.).....		2		2		2			
Lymphadenitis (nonvenereal).....	1			1			1		
Hemorrhage; other diseases of the circulatory system.....	1			1					

TABLE IV. —DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
<i>Diseases of the respiratory system.</i>									
Diseases of the larynx.....	1			1		1			
Laryngitis.....		2		2		1			
Acute bronchitis.....	30	18	2	46		27	17	2	
Chronic bronchitis.....	5	7	2	10		3	4	1	
Broncho-pneumonia.....	73	55	20	108		51	34	6	3
Pneumonia (unqualified).....	12	10	4	18		3	7		2
Lobar pneumonia.....	47	19	6	59	1	5	4		
Pleurisy.....	2	5	1	6			1	1	
Empyema.....	1	1		2					2
Pulmonary congestion, pulmonary apoplexy.....	3	1	1	3					
Gangrene of the lungs.....	3	3		6					
Asthma.....	2		1	1					
Other diseases of the respiratory system (tuberculosis excepted).....	2			2		1			
Abscess of the lungs.....	3	1	1	3		1			1
<i>Diseases of the digestive system.</i>									
Diseases of the pharynx:									
Follicular tonsillitis.....		1		1				1	
Stricture of the esophagus.....		2		2					
Ulcer of the stomach.....	4		1	3		1			
Other diseases of the stomach (cancer excepted):									
Gastrectasis.....		1		1					
Acute gastritis.....	14	7	2	19		9	6		
Acute indigestion.....	4	4	1	6	1	3	2		
Diarrhea and enteritis (under 2 years).....	99	102	15	185	1	156	45		
Colitis (under 2 years).....	6	6	3	9		10	2		
Diarrhea and enteritis (2 years and over).....	6	7		13			8	2	
Colitis (2 years and over).....	1	3		4			2	1	
Appendicitis and typhlitis:									
Acute appendicitis.....	7	2	5	4				1	3
Chronic appendicitis.....	1			1					1
Hernia, intestinal obstructions.....		1		1					1
Inguinal hernia.....	4			4					
Other hernias.....	1	1	2						
Intestinal obstruction.....	8	2	1	8	1	3	1	1	
Other diseases of the intestines.....		2	1	1					
Constipation.....		1		1					
Duodenal ulcer.....	1			1					
Acute yellow atrophy of the liver.....	1			1					
Cirrhosis of the liver.....	9	7	3	11	2	1			1
Biliary calculi.....		4	2	2					
Other diseases of the liver.....	2			2		1	1		
Abscess of the liver (unqualified).....	1	1	1	1					
Abscess of the liver (entamebic).....	1			1					
Cholecystitis.....		1		1					
Diseases of the spleen.....	1		1						
Simple peritonitis (nonpuerperal).....	2	4	1	5					1
Other diseases of the digestive system (cancer and tuberculosis excepted).....		1		1					

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
<i>Nonvenereal diseases of the genito-urinary system and annexa.</i>									
Acute nephritis.....	7	14	2	19	.....	10	5	3	1
Bright's disease (chronic nephritis)...	70	40	23	84	3	.....	2	.....	3
Other diseases of the kidney and annexa.....	3	2	.....	5	.....	1	.....	.....	.....
Pyelo-nephrosis.....	8	5	2	11	.....	4	3	.....	.....
Calculi of the urinary passages.....	1	.....	1	.....	.....	.....	.....	.....	.....
Cystitis.....	2	1	.....	3	.....	.....	.....	.....	.....
Diseases of the prostate.....	1	.....	1	.....	.....	.....	.....	.....	.....
Hypertrophy of prostate.....	1	.....	.....	1	.....	.....	.....	.....	.....
Uterine tumor (noncancerous).....	.....	4	.....	4	.....	.....	.....	.....	.....
Other diseases of the uterus.....	.....	2	.....	2	.....	.....	.....	.....	.....
Salpingitis and other diseases of the female genital organs.....	.....	7	1	6	.....	.....	.....	.....	.....
<i>The puerperal state.</i>									
Accidents of pregnancy.....	.....	2	.....	2	.....	.....	.....	.....	.....
Extra uterine pregnancy.....	.....	2	2	.....	.....	.....	.....	.....	.....
Hyperemesis gravidarum.....	.....	1	.....	1	.....	.....	.....	.....	.....
Puerperal hemorrhage.....	.....	7	1	6	.....	.....	.....	.....	.....
Other accidents of labor.....	.....	4	1	3	.....	.....	.....	.....	1
Puerperal septicemia.....	.....	8	3	5	.....	.....	.....	.....	2
Puerperal albuminuria and convulsions.....	.....	4	1	3	.....	.....	.....	.....	.....
Eclampsia.....	.....	10	1	9	.....	.....	.....	.....	1
<i>Diseases of the skin and of the cellular tissue.</i>									
Acute abscess:	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phlegmon and cellulitis.....	2	1	.....	3	.....	.....	.....	.....	1
<i>Diseases of the bones and of the organs of locomotion.</i>									
Diseases of the bones (tuberculosis excepted).....	2	.....	1	1	.....	.....	.....	.....	1
<i>Malformations.</i>									
Congenital malformations (stillbirth not included).....	12	12	3	21	.....	21	3	.....	.....
<i>Diseases of early infancy.</i>									
Congenital debility, icterus, and sclerema.....	21	10	3	27	1	31	.....	.....	.....
Premature birth.....	40	30	9	60	1	70	.....	.....	.....
Atrophy of infants.....	1	.....	.....	1	.....	1	.....	.....	.....
Malnutrition.....	28	20	.....	48	.....	43	5	.....	.....
Other causes peculiar to early infancy (including various consequences of labor).....	19	16	2	32	1	35	.....	.....	.....

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21-30	31-40	41-50	51-60	61-75	76-100	Age un-known.	Pan-ama.	Colon.	Canal Zone.	Total.
		2					14	6	1	21
12	22	26	20	16	8	1	63	39	8	110
1	1	2					4	1		5
1	2		1		2		6	5	2	13
	1						1			1
	1			2			3			3
				1					1	1
				1				1		1
1	3							4		4
		1	1				1	1		2
4	3						3	4		7
2								1	1	2
1	1						1		1	2
1							1			1
4	2	1					5	1	1	7
2	1						2	2		4
4	2						7		1	8
3	1						1	2	1	4
7	1	1					5	4	1	10
1		1					3			3
	1						1		1	2
							10	5	9	24
							21	9	1	31
							47	13	10	70
								1		1
							17	15	16	48
							22	9	4	35

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
<i>Old age.</i>									
Senility.....	5	6	3	8					
<i>Affections produced by external causes.</i>									
Suicide by firearms.....	8		5	3					2
Suicide by cutting or piercing instruments.....	2			1	1				
Acute poisonings.....	3	3	2	4		1	1	1	
Burns (conflagration excepted).....	3	2	1	4			4		
Accidental drowning.....	16	3	6	13				1	4
Traumatism by firearms.....	1		1						1
Traumatism by cutting or piercing instruments.....	1			1					
Traumatism by fall.....	12	2	6	8			7	1	
Traumatism by machines.....	1			1					1
Traumatism by other crushings (vehicles, etc).....	18	2	6	14			1	2	2
Railroad traumatism.....	6	1	1	6			1		
Dynamite traumatism.....	1			1			1		
Injuries by animals.....	1			1					
Starvation.....		1		1			1		
Lightning.....	1			1					
Electricity (lightning excepted).....	2	1		3					
Homicide by firearms.....	4	6	2	8					3
Homicide by cutting or piercing instruments.....	6	2	2	5	1				
Homicide by other means.....	3		2		1				
Fractures (cause not specified).....		1	1						
Other external violence.....	3		1	1	1				1
Legal execution.....	3			3					
<i>Ill-defined diseases.</i>									
Ill-defined organic disease.....	2			2		1			
Sudden death.....	3	2	2	3				1	
Cause of death not specified or ill-defined.....	13	10	2	21		9	8		2
Infections of undetermined origin.....	2	1	1	2		1			
Grand total.....	1,204	889	296	1,760	37	567	245	50	104

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21-30	31-40	41-50	51-60	61-75	76-100	Age un-known.	Pan-ama.	Colon.	Canal Zone.	Total.
			1	3	7		9	2		11
5						1	2	5	1	8
1	1	1					1	1		2
	2						3	2	1	6
	1						2	2	1	5
5	6	2	1				5	6	8	19
									1	1
		1						1		1
2		2	2				6	3	5	14
							1			1
6	5	1		3			10	4	6	20
2	3	1					4	1	2	7
	1						1			1
							1			1
1							1			1
1	1						3		1	3
6	1	1					7	3		10
4	3		1				2	3	3	8
1	2						1	1	1	3
					1		1			1
	1	1						2	1	3
2	1							3		3
1								1	1	2
1	2			1			5			5
4							14	6	3	23
2							1	1	1	3
324	313	199	146	97	45	3	1,297	554	242	2,093

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Typhoid fever.....	4	1	5		
Malarial fever, estivoautumnal.....	6	1	1	6	
Influenza.....	7	1	6	2	
Hemoglobinuric fever, unqualified.....	1		1		
Septicemia.....	3			3	
Tetanus.....	1			1	
Tuberculosis of the lungs.....	20	7	7	20	
Acute miliary tuberculosis.....	1			1	
Disseminated tuberculosis.....	3	1		4	
Syphilis, tertiary.....	2	1	1	2	
Syphilis, period not stated.....	2		1	1	
Cancer and other malignant tumors of the buccal cavity.....		1	1		
Cancer and other malignant tumors of the stomach and liver.....	3		1	2	
Cancer and other malignant tumors of the female genital organs.....		2	1	1	
Cancer and other malignant tumors of other organs and of organs not specified.....	1	1	1	1	
Diabetes.....	2		1	1	
Anemia, secondary, cause not determined.....	1			1	
Encephalitis.....	1			1	
Cerebrospinal fever.....	1			1	
Pneumococcus meningitis.....	1			1	
Cerebral hemorrhage, apoplexy.....	1			1	
Epilepsy.....	1		1		
Neurasthenia.....	1		1		
Pericarditis.....	1			1	
Acute endocarditis.....	1	1	1	1	
Malignant endocarditis.....	2			2	
Organic diseases of the heart.....	12	4	6	10	
Aneurysm.....	1		1		
Arteriosclerosis.....	1	1		2	
Hemorrhage; other diseases of the circulatory system.....	1			1	
Diseases of the thyroid body.....	1		1		
Acute bronchitis.....	1			1	1
Broncho-pneumonia.....	6		2	4	
Pneumonia (unqualified).....		1		1	
Lobar pneumonia.....	12		3	9	
Pleurisy.....	1			1	
Ulcer of the stomach.....	2		1	1	
Diarrhea and enteritis (under 2 years).....	2			2	1
Diarrhea and enteritis (2 years and over).....	1			1	
Acute appendicitis.....	2		2		
Inguinal hernia.....	1			1	
Other diseases of the intestines.....	1	1	1	1	
Cirrhosis of the liver.....	3		1	2	
Other diseases of the liver.....	1		1		
Simple peritonitis.....	1		1		
Bright's disease (chronic nephritis).....	13	3	5	11	
Other diseases of the kidney and annexa.....	1			1	
Pyelo-nephrosis.....	1			1	
Cystitis.....	2			2	
Stricture of the urethra, nonvenereal.....	1			1	
Uterine tumor (noncancerous).....		1		1	
Accidents of labor.....		1		1	
Puerperal hemorrhage.....		2		2	
Eclampsia.....		1		1	
Phlegmon and cellulitis.....	1			1	

" Includes deaths of all nonresidents, passengers off incoming ships, etc. Deaths of nonresidents

OF NONRESIDENTS."

Age (in years).										Total.
1-4	5-10	11-20	21-30	31-40	41-50	51-60	61-75	Over 75	Un- known.	
		2	1	1	1					5
1	1	1	2	1		1				7
		1	3	2	1	1				8
							1			1
		1	1	1						3
				1						1
			10	8	4	4		1		27
				1						1
1				2		1				4
			2	1						3
			1		1					2
					1					1
						2		1		3
				1	1					2
					2					2
		1	1							2
		1	1							1
		1								1
			1							1
			1		1					1
			1				1			1
			1							1
			1		1					2
			1		1					2
			4	4	5		2		1	16
				1			1			1
					1					2
					1	1				1
										1
1			1	2	1		1			6
				1	1		1			1
		1	6	1	1	2	1			12
				2						1
1										2
1										2
			2							1
					1					2
				2						1
				2		1				2
				1						3
							1			1
								1		1
		1	3	4	4	3	1			16
						1				1
					1		2			1
										2
			1							1
			1							1
			1		1					1
			1							2
			1							1
				1						1

are not taken up in the statistical charts relating to Panama, Colon, and the Canal Zone.

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Diseases of the bones.....		1	1		
Congenital malformations.....		1		1	1
Congenital debility, icterus, and sclerema.....		1		1	1
Premature birth.....	2	1		3	3
Malnutrition.....		1		1	1
Senility.....		1	1		
Suicide by drowning.....	1			1	
Suicide by cutting or piercing instruments.....	1		1		
Burns.....	1			1	
Absorption of deleterious gases.....	1		1		
Accidental drowning.....	7	1	5	3	
Traumatism by cutting or piercing instruments.....		1		1	
Traumatism by fall.....	5		3	2	
Traumatism by machines.....	1		1		
Railroad traumatism.....	1		1		
Homicide by firearms.....	3		1	2	
Homicide by cutting or piercing instruments.....	2		2		
Homicide by other means.....	1			1	
Cause of death not specified or ill-defined.....	2		1	1	
Total.....	164	40	73	131	8

¹² Includes deaths of all nonresidents, passengers off incoming ships, etc. Deaths of nonresidents

OF NONRESIDENTS¹²—Continued.

Age (in years).										Total.
1-4	5-10	11-20	21-30	31-40	41-50	51-60	61-75	Over 75	Un- known	
					1					1
										1
										1
										3
										1
							1			1
				1						1
				1						1
			1							1
				1						1
		2	3	1	2					8
				1						1
			4			1				5
				1						1
		1								1
		1								3
			2							2
				1						1
			2							2
5	1	13	63	46	35	20	10	2	1	204

are not taken up in the statistical charts relating to Panama, Colon, and the Canal Zone.

TABLE V.—DEATHS BY NATIONALITY OR NATIVITY, YEAR 1920.

Country.	Employees.		Nonemployees.		Total.		Grand total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Antigua.....	6		4	4	10	4	14
Africa.....			1		1		1
Barbados.....	38	1	159	134	197	135	332
Bolivia.....				1		1	1
Bahamas.....	1		1		2		2
British Guiana.....			2	2	2	2	4
Chile.....			4	2	4	2	6
China.....			39	3	39	3	42
Colombia.....	8		59	40	67	40	107
Costa Rica.....	1		9	4	10	4	14
Cuba.....			4	1	4	1	5
Curacao.....			1	2	1	2	3
Demerara.....	1		2	4	3	4	7
Dominica.....			4	1	4	1	5
England.....			2	2	2	2	4
Ecuador.....			6	3	6	3	9
France.....	2		4	5	6	5	11
Fortune Island.....	1		1	1	2	1	3
Grenada.....	5		11	9	16	9	25
Greece.....	1		3	1	4	1	5
Guadeloupe.....	5	1	5	4	10	5	15
Germany.....			1		1		1
Guatemala.....	1				1		1
Haiti.....	1		2		3		3
Honduras.....			2	1	2	1	3
India.....			2	1	2	1	3
Italy.....	1		8	3	9	3	12
Jamaica.....	33		247	219	280	219	499
Japan.....			3	1	3	1	4
Martinique.....	4		20	24	24	24	48
Mexico.....	1		4	2	5	2	7
Montserrat.....	1		5	3	6	3	9
Nicaragua.....			3	1	3	1	4
Nassau.....	1		4	1	5	1	6
Norway.....	1				1		1
Panama.....	26	1	300	330	326	331	657
Peru.....	1		7	8	8	8	16
Porto Rico.....				1		1	1
St. Kitts.....	1				1		1
St. Lucia.....	5		19	16	24	16	40
St. Thomas.....			5	3	5	3	8
St. Vincent.....	3		6	4	9	4	13
Scotland.....			1		1		1
Spain.....	1		19	5	20	5	25
Trinidad.....	2	1	7	8	9	9	18
United States.....	16		33	15	49	15	64
Venezuela.....	1		4	5	5	5	10
Virgin Islands.....	1				1		1
Holland.....				1		1	1
Poland.....				1		1	1
Palestine.....				1		1	1
Portugal.....				1		1	1
Philippines.....			1		1		1
Santo Domingo.....			1		1		1
Syria.....			1		1		1
Switzerland.....			1		1		1
Denmark.....			1		1		1
Hungary.....	1				1		1
Grand Cayman.....				1		1	1
Roumania.....				1		1	1
Unknown.....			7	4	7	4	11
Totals.....	171	4	1,035	884	1,206	888	2,094

TABLE VI.—STATISTICS RE AMERICAN EMPLOYEES AND THEIR FAMILIES.

	Annual death rate per 1,000 population.
White employees from the United States:	
Disease.....	3.32
External causes.....	.95
Total.....	4.27
White women and children from the United States:	
Disease.....	3.80
External causes.....	.72
Total.....	4.52
White employees from the United States and their families:	
Disease.....	3.59
External causes.....	.82
Total.....	4.41
Number of American children born on the Isthmus during year 1920.....	205
Deaths among American children under 1 year of age.....	10
Infant mortality rate among American children (number of deaths per 1,000 births)....	48.78

TABLE VII.—BIRTHS AND BIRTH RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Rate per 1,000 population.		
		Total.	Alive.	Still-born.	Total.	Alive.	Still-born.
Year, 1920:							
Panama.....	60,935	2,532	2,376	156	41.55	38.99	2.56
Colon.....	26,078	1,014	962	52	38.88	36.89	1.99
Canal Zone.....	27,459	667	631	36	24.29	22.98	1.31
Total.....	114,472	4,213	3,969	244	36.80	34.67	2.13
Year, 1919:							
Panama.....	61,369	2,359	2,214	145	38.44	36.08	2.36
Colon.....	26,078	964	908	56	36.97	34.82	2.15
Canal Zone.....	26,511	732	695	37	27.61	26.22	1.39
Total.....	113,958	4,055	3,817	238	35.58	33.50	2.09

TABLE VIII.—INFANT MORTALITY RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Deaths among children under 1 year of age.	Death rate per 1,000 births.
		Male.	Female.	Total.		
Year, 1920:						
Panama.....	60,500	1,150	1,226	2,376	369	155.30
Colon.....	26,078	503	459	962	137	142.41
Canal Zone.....	27,459	348	283	631	60	95.09
Total.....	114,037	2,001	1,968	3,969	566	142.61
Year, 1919:						
Panama.....	61,369	1,190	1,024	2,214	342	154.47
Colon.....	26,078	479	429	908	141	155.29
Canal Zone.....	26,511	355	340	695	79	113.67
Total.....	113,958	2,024	1,793	3,817	562	147.24

TABLE IX.—DEATHS OF INFANTS BY CAUSE,

Cause of death.	Sex.		Color.		—1 week.	+1 week —1 month.
	M.	F.	W.	B.		
Measles.....		1		1		
Whooping cough.....		2		2		
Diphtheria and croup.....	1			1		
Influenza.....	4	2	1	5		
Dysentery.....	1			1		
Dysentery, bacillary.....	2			2		
Pyemia.....	1			1		
Tuberculosis of the lungs.....	1	4		5		
Acute miliary tuberculosis.....	2	1	1	2		
Tuberculous meningitis.....	1			1		
Disseminated tuberculosis.....	1	2		3		
Syphilis, hereditary.....	8	1	3	6	3	2
Encephalitis.....	1			1		
Simple meningitis.....	6	1	2	5		
Cerebro-spinal fever.....	1	1		1		
Pneumococcus meningitis.....	2	1		3		
Cerebral hemorrhage, apoplexy.....	1		1			
Epilepsy.....	1			1		
Convulsions of infants.....	1	2	1	2	1	
Diseases of the ears.....	3			3		
Pericarditis.....	1		1			
Acute endocarditis.....	1	1		2		
Malignant endocarditis.....		1		1		
Phlebitis.....	1			1		
Diseases of the lymphatic system (lymphangitis, etc.).....		2		2		
Diseases of the larynx.....	1			1		
Laryngitis.....		1		1		
Acute bronchitis.....	19	9	1	27	1	3
Chronic bronchitis.....	2		1	1		
Broncho-pneumonia.....	29	22	8	43	2	
Pneumonia (unqualified).....	2	1		3		
Lobar pneumonia.....	2	3	1	4		1
Other diseases of the respiratory system (tuberculosis excepted).....	1			1	1	
Abscess of lung.....	1		1			
Ulcer of the stomach.....	1			1		
Acute gastritis.....	7	2		9		
Acute indigestion.....	2	1		3	1	
Diarrhea and enteritis.....	78	78	16	140	2	9
Colitis.....	4	6	3	7		
Intestinal obstruction.....	3			3		
Cirrhosis of the liver.....		1		1		
Other diseases of the liver.....	1			1		1
Acute nephritis.....	4	6	1	9		1
Other diseases of the kidney and annexa.....	1			1		
Pyelo-nephrosis.....	4			4		
Congenital malformations (stillbirth not included).....	9	12	3	18	10	3
Congenital debility, icterus, and sclerema.....	16	7	1	22	17	5
Premature birth.....	40	30	9	61	64	5
Congenital debility.....	5	2	1	6	5	1
Atrophy of infants.....	1			1		
Malnutrition.....	23	20		43	2	2
Other causes peculiar to early infancy (including various consequences of labor).....	19	16	1	34	27	5
Acute poisonings.....		1	1			
Ill-defined organic disease.....	1			1		
Cause of death not specified or ill-defined.....	4	5	1	8	3	1
Infections of undetermined origin.....	1			1		
Totals.....	321	245	59	507	139	39

SEX, COLOR, AGE, AND PLACE OF RESIDENCE.

Age (by months).											Place of residence.			
1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	Panama	Colon.	Canal Zone.	Total.
1		1								1	1			1
										2	2			2
										1	1			1
				1		1	2	1		1	2		4	6
				1							1			1
				1		1						1		2
		1											1	1
	1		1	2	1						5			5
		1			2						2	1		3
1												1		1
	1	1	1								2	1		3
2								1	1		6	3		9
									1		1			1
	2			2		1	1		1		6		1	7
			1								1			1
	1	1				1					1	1	1	3
											1			1
								1			1			1
								1			3			3
						1					1			1
								2			1		2	3
		1									1			1
	1						1				1		1	2
						1					1			1
			1								1			1
		1	1								2			2
	1										1			1
1											1			1
	3	4		3	2	4	1	2	3	2	9	19		28
			1									2		2
2	7	4	6	2	6	3	8	2	2	7	43	7	1	51
		1		1		1					3			3
		1	2		1						2	2	1	5
1												1		1
												1		1
1	1	2				2	2				1			1
		2									9			9
		1									1	1		3
11	23	10	13	7	9	9	15	24	12	12	119	33	4	156
	2	2		1		1	1	1	1	1	8	2		10
					2							2	1	3
				1								1		1
		1	2		1	1	1		1	2	1	7		1
	1													
												1		1
1							1				2	1	1	4
1	3			1		1		1	1		9	4	8	21
1											14	9		23
1											47	13	10	70
											6		1	7
			1									1		1
6	8	5	4	3	3	2	4	1	1	2	15	15	13	43
	1	1							1		21	9	5	35
										1		1		1
	1												1	1
	1			1		2				1	6	1	2	9
		1									1			1
31	63	40	33	27	27	32	40	36	27	32	369	137	60	566

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>General diseases.</i>								
Typhoid fever.....			2				3	
Typhoid bacillus carrier.....			1					
Paratyphoid fever.....								
Relapsing fever.....	1		1					
Malaria.....			1					
Estivoautumnal.....	45	8	218	4	3			
Tertian.....	30	3	62	1				
Quartan.....			6					
Mixed.....			1					
Clinical.....	1		5					
Cachexia.....								
Smallpox.....			1					
Varioloid.....								
Vaccina.....			8					
Measles.....	2	1	14					
Scarlet fever.....		1						
Whooping cough.....			1					
Diphtheria and croup.....			2					
Diphtheria bacillus carrier.....								
Influenza.....	156	27	414	4	2		18	
Dysentery, entamebic.....	6		5				1	
Dysentery, bacillary.....	1		6					
Leprosy.....								
Erysipelas.....								
Chickenpox.....			25	1				
Mumps.....		1	9					
Hemoglobinuric fever, unqualified.....								
Yaws.....			2					
Filiariasis.....			1					
Purulent infection and septicemia.....	2	1	4					
Pyemia.....								
Septicemia.....	1							
Pyemia and septicemia, pneumococcic.....								
Tetanus.....								1
Pellagra.....			1					1
Tuberculosis of the lungs.....	4	1	37	2			13	
Acute miliary tuberculosis.....			1					
Tuberculous meningitis.....								
Abdominal tuberculosis.....			1				1	
Pott's disease.....							2	
Tuberculosis of bones and joints.....								
Tuberculosis of other organs.....			1					
Tuberculosis of the larynx.....								
Tuberculosis of the skin.....			1					

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>General diseases.—Continued.</i>								
Tuberculosis of the lymph glands.....			5					
Tuberculosis of the genitourinary organs.....	1		1					
Tuberculous abscess.....	1							
Disseminated tuberculosis.....							10	
Rickets.....								
Syphilis:								
Primary.....	1		6					
Secondary.....	2		9					
Tertiary.....	7		94				1	
Cerebro-spinal.....	13		13				2	
Hereditary.....								
Period not stated.....			2					
Gonococcus infection.....								
Gonorrhea.....	33		211					
Gonorrheal arthritis.....			7					
Gonorrheal bubo.....			2					
Gonorrheal orchitis and epididymitis.....	4		3					
Gonorrheal ophthalmia.....			2					
Soft chancre.....	13		121					
Adenitis chancroidal.....	1		5					
Cancer and other malignant tumors of the buccal cavity.....	1							
Cancer and other malignant tumors of the stomach and liver, esophagus, and pharynx.....			3		1			
Cancer and other malignant tumors of the peritoneum, intestines, rectum.....	1		1		1			
Cancer and other malignant tumors of the female genital organs.....			1					
Cancer and other malignant tumors of the breast.....								
Cancer and other malignant tumors of the skin.....			1					
Cancer and other malignant tumors of other organs and of organs not specified.....	3		3				2	
Other tumors (tumors of the female genital organs excepted).....	3		9	1				
Acute articular rheumatism.....								
Chronic rheumatism and gout.....	1		1					
Gout.....								
Arthritis deformans.....								
Scurvy.....								
Diabetes.....	2		1					
Glycosuria.....								
Exophthalmic goiter.....		1						
Leukemia.....								
Hodgkin's disease.....			1					
Anemia, secondary, cause not determined.....	1	1	4					

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>General diseases—Continued.</i>								
Other general diseases.....	5	1	1					
Purpura hemorrhagica.....							1	
Alcoholism (acute or chronic).....	11		1					
Alcoholism, acute.....	14		2					
Alcoholism, chronic.....	3							
Alcoholic psychosis.....								
Chronic lead poisoning.....	2		3					
Other chronic occupational poisonings.....								
Other chronic poisonings.....	1							
Drug habit.....								
<i>Diseases of the nervous system and of the organs of special sense.</i>								
Encephalitis.....								1
Simple meningitis.....								1
Cerebrospinal fever.....			1					1
Pneumococcus meningitis.....								2
Locomotor ataxia.....								
Other diseases of the spinal cord.....								
Acute anterior polio-myelitis.....								
Cerebral hemorrhage, apoplexy.....			1		1		3	
Softening of the brain.....							1	
Paralysis without specified cause.....	3		3					
General paralysis of the insane.....								
Other forms of mental alienation.....			1					
Dementia precox.....			3					
Manic depressive psychosis.....								
Toxic psychosis.....			1					
Epilepsy.....								
Convulsions, nonpuerperal (5 years and over).....								
Convulsions of infants (under 5 years of age).....								
Chorea.....								
Hysteria.....	2	2						
Neuralgia.....	2		2					
Neuritis.....	10		7					
Other diseases of the nervous system.....	6	5	8					
Organic disease of the brain.....	1							
Tumor of the brain.....								
Neurasthenia.....	9	3	3					
Diseases of the eyes and their annexa.....	9	1	57	1				
Follicular conjunctivitis.....			2					
Trachoma.....			7					
Cornea.....	17		28					
Iris.....	7	1	17					

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>Diseases of the nervous system and of the organs of special sense.—Continued.</i>								
Diseases of the eyes and their annexa—Continued:								
Lens.....			4					
Fundus.....			1					
Diseases of the ears.....	3			1				
Otitis, external.....	3	2	7					
Otitis media.....	4	4	7	1				
<i>Diseases of the circulatory system.</i>								
Pericarditis.....			1					
Acute endocarditis.....								
Malignant endocarditis.....				1			2	
Organic diseases of the heart.....	6		12				6	
Angina pectoris.....			1					
Diseases of the arteries, atheroma, etc.....			4				1	
Aneurysm.....			1				1	
Arteriosclerosis.....	1		1					
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.).....	2		3					
Hemorrhoids.....	20		20	1				
Varices.....	2		1					
Varicocele.....	3		5					
Phlebitis.....	1							
Diseases of the lymphatic system (lymphangitis, etc.).....	12		13					
Lymphadenitis (nonvenereal).....	21	1	41					
Hemorrhage; other diseases of the circulatory system.....	6		1					
<i>Diseases of the respiratory system.</i>								
Diseases of the nasal fossae.....	30	11	22					
Adenoid vegetations.....								
Myiasis of nasal fossae and sinuses.....	1							
Diseases of the larynx.....			1					
Laryngitis.....	1							
Diseases of the thyroid body.....			2					
Acute bronchitis.....	23	5	55	3				
Chronic bronchitis.....	4		2					
Broncho-pneumonia.....	1		2				3	
Pneumonia (unqualified).....							1	
Lobar pneumonia.....			17		1		12	
Pleurisy.....	2	1	8	1				
Empyema.....			2					
Pulmonary congestion, pulmonary apoplexy.....								

[illegible]

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>Diseases of the respiratory system—Continued.</i>								
Gangrene of the lungs.....								
Asthma.....	1	1	13	1				
Pulmonary emphysema.....	1							
Other diseases of the respiratory system (tuberculosis excepted).....								
Abscess of lungs.....	2							
<i>Diseases of the digestive system.</i>								
Diseases of the mouth and annexa.....	2		4	1				1
Diseases of the teeth and gums.....	3	3	13	1				
Stomatitis.....								
Diseases of the pharynx.....	3		7					
Pharyngitis.....	7		3					
Follicular tonsillitis.....	57	30	44	2				
Ulcer of the stomach.....	8		4				1	
Other diseases of the stomach (cancer excepted).....	4		6					
Acute gastritis.....	13		15					
Chronic gastritis.....	4		7					
Acute indigestion.....	10	1						
Diarrhea and enteritis (under 2 years).....								
Colitis (under 2 years).....								
Diarrhea and enteritis (2 years and over).....	11		4					
Colitis (2 years and over).....	3	7	4					
Ankylostomiasis.....	1		29					
Intestinal parasites.....	4		9					
Ascariasis.....	2							
Bilharziasis, intestinal.....								
Teniasis.....	1							
Strongyloidosis.....			1					
Appendicitis and typhlitis.....			1					
Acute appendicitis.....	11	3	5		2			
Chronic appendicitis.....	17	6	3					
Hernia, intestinal obstructions.....								
Inguinal hernia.....	20	1	57				2	
Other hernias.....	4		3	1	1			
Intestinal obstruction.....							1	
Other diseases of the intestines.....	21	9	9	3				
Constipation.....	9	2	18					
Duodenal ulcer.....	4		1				1	
Acute yellow atrophy of the liver.....								
Cirrhosis of the liver.....	1		2		1			
Biliary calculi.....	2		2					
Other diseases of the liver.....	5		1					

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.										Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.							
White.			Black.		White.			Black.		White.		Black.		White.		Black.					
Soldiers.	Others.				Soldiers.	Others.				Soldiers.	Others.		Soldiers.	Others.		Soldiers.	Others.		Soldiers.			Others.
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.				
3	2	7	1	4		1			1	2		2						37	1		
2										1								4	1		
	1									1								2			
										2								4			
5	3	1	1	2						2								21	1		
1	2	10	1	8						5	1							48			
	1		1	3														5			
2	4	2	1	2						3	1	1						26			
1	4	5		1						2								23			
76	104	118	38	100					1	18	7	2						596	1		
	1	3								2								18	1		
3	2	3		4						1	2							25			
6	3	2	2	7						8								56			
3	2	1		1						3								21			
3	1	4																19			
	1	1	4	2				2										8	2		
	1	4	1	2						2								10			
1	3	6		4					2	3	1	2						35	2		
2		5	2	2						4	1							30			
		2	1	1						1	1	3						39			
1		2		2						2	1	1						22			
	2	1	1	4						5	5							20			
		1								1	3							1			
																		5			
																		1			
1		1																3			
64	9	29	2	9			1	1		10	3			2				145	6		
10	2	21		5						5	3	1						73			
1		1								1								3			
33	10	4	22	2				1		25		5						179	3		
4	1	6	3	5						1		1						29	1		
		1						3										1	4		
7	8	12	4	19						16	2							110			
1	2	8	4	5						10	3	1						63			
1	1	1								4								12	1		
1																		1			
	1	1						2		3								8	3		
		8		1			1		1		1							14	2		
3	1	1	1							7	1	1						21			

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>Diseases of the digestive system.—Continued.</i>								
Other diseases of the liver—Continued:								
Abscess of liver (unqualified).....	1		1					
Abscess of the liver, entamebic.....	1							
Cholecystitis.....	4		2	1				
Diseases of the spleen.....								
Simple peritonitis (nonpuerperal).....	2		2					
Other diseases of the digestive system (cancer and tuberculosis excepted).....	3	1	3					
<i>Nonvenereal diseases of the genito-urinary system and annexa.</i>								
Acute nephritis.....	2							
Bright's disease (chronic nephritis).....	7		20		2		8	
Other diseases of the kidney and annexa.....	4	2	1					
Movable kidney.....				1				
Pyelo-nephrosis.....	5	1	3					
Calculi of the urinary passages.....	16	1	2					
Diseases of the bladder.....			2					
Cystitis.....	4	3	1	2				
Diseases of the urethra, urinary abscess, etc.....	3	1	8					
Stricture of the urethra, nonvenereal.....	6		24					
Vesico-vaginal fistula.....								
Diseases of the prostate.....								
Acute prostatitis.....			1					
Chronic prostatitis.....	3							
Abscess of the prostate.....								
Hypertrophy of prostate.....			1					
Nonvenereal diseases of the male genital organs.....	8		46					
Hydrocele.....	5		12					
Lymph scrotum and varix.....								
Uterine hemorrhage (nonpuerperal).....		5		1				
Uterine tumor (noncancerous).....				1				
Other diseases of the uterus.....		6		5				
Metritis.....				1				
Cysts and other tumors of the ovary.....		1						
Salpingitis and other diseases of the female genital organs.....		3		2				1
Nonpuerperal diseases of the breast (cancer excepted)								
Benign tumor of breast.....								
<i>The puerperal state.</i>								
Normal labor.....		1						
Accidents of pregnancy.....				1				
Extra-uterine pregnancy.....								
Hyperemesis gravidarum.....								
Abortion.....		8		2				
Puerperal hemorrhage.....								

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
							1												
										1									
4			6		1					2	1								
2										1									
			3		8				1										
1	1	1								1									
1	4		7	7					2	1									
3	3	2	3	5		1	3	5	3	7		1		2					
3		16	2	18				3	1	1									
		2		1							1								
6	1	21	2	9				2		4	2								
3	3	7	3							2			1						
1		2		1															
3	1	7		10						3	1								
	1	1	2	1						6									
2	1		2							2		3							
				2															
1																			
2						1													
1								1											
	1		2																
5	6		30							11		2							
4	1		5							3									
1																			
		7		3															
		4		25					3			1							
		29		72								9		1					
		4		6															
		8		24								1							
		19		61					4			2							
		3		11															
		1		1								1							
		210		121															
		16		26			1		1			1							
		3		7								1							
		8		15															
		51		24								1							
				5					1										

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>The puerperal state.—Continued.</i>								
Other accidents of labor.....								
Puerperal septicemia.....								
Puerperal albuminuria and convulsions.....								
Eclampsia.....								
Following childbirth (not otherwise defined).....								
Puerperal diseases of the breast.....								
<i>Diseases of the skin and of the cellular tissue.</i>								
Gangrene.....			1					
Raynaud's disease.....								
Furuncle.....	10		2					
Carbuncle.....	5		2					
Acute abscess.....	9		34					
Phlegmon and cellulitis.....	22		65				1	
Trichophytosis.....	1	1	3					
Scabies.....	1		3					
Chiggers (<i>Pulex penetrans</i>).....								
Elephantiasis.....								
Myiasis of skin.....			1					
Dhobie itch.....	7	3	2					
Prickly heat.....			8					
Ulcer of the skin.....	1		44					
Oriental sore (Leishmaniasis).....								
Tropical ulcer.....				1				
Impetigo contagiosa.....		1	2					
Urticaria.....	1							
Ingrowing nail.....	6	1	3					
Other diseases of the skin and annexa.....	22	3	19	1				
<i>Diseases of the bones and of the organs of locomotion.</i>								
Diseases of the bones (tuberculosis excepted).....	3		1				1	
Caries (nontuberculous).....								
Mastoid abscess.....			4					
Osteomyelitis.....	2		3					
Periostitis.....	4		1					
Diseases of the joints (tuberculosis and rheumatism excepted).....	1		4					
Ankylosis.....								
Arthritis.....	7		19	2				
Synovitis.....	1		2					
Other diseases of the organs of locomotion.....	19	3	27	3				
<i>Malformations.</i>								
Congenital malformations (stillbirth not included)...	2		6					

[illegible]

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
<i>Diseases of early infancy.</i>								
Newborn child.....								
Premature birth.....								
Congenital debility.....								
Atrophy of infants.....								
Malnutrition.....								
Other causes peculiar to early infancy (including various consequences of labor).....								
<i>Old age.</i>								
Senility.....	1							
Senile dementia.....	1							
<i>Affections produced by external causes.</i>								
Suicide by firearms.....	1							
Suicide by cutting or piercing instruments.....								
Poisoning by food.....	9	1	5					
Other acute poisonings.....	3	1	1				1	
Venomous bites and stings.....		1						
Burns (conflagration excepted).....	8	1	22				1	
Absorption of deleterious gases (conflagration excepted).....			6					
Traumatism by firearms.....			2					
Traumatism by cutting or piercing instruments.....	10		114				1	
Traumatism by fall.....	27	6	118		1		1	
Traumatism in mines and quarries.....								
Traumatism by machines.....	10		26				1	
Traumatism by other crushings.....	11	4	54				1	
Railroad traumatism.....			1					
Injuries by animals.....			2					
Excessive cold.....			1					
Effects of heat.....			1					
Heat exhaustion.....			3					
Lightning.....								
Electricity (lightning excepted).....	1		2					
Homicide by firearms.....								
Homicide by cutting or piercing instruments.....								
Homicide by other means.....								
Fractures (cause not specified).....	5		7					
Dislocations.....			3					
Sprains.....	5	1	14					
Other external violence.....	35		247					
<i>Ill-defined diseases.</i>								
Ill-defined organic disease.....								
Sudden death.....	1		1					
Cause of death not specified or ill-defined.....	1							
Infections of undetermined origin.....	14	2	12				2	
No disease.....	8	7	32	1				
Feigned disease.....								
Totals.....	1164	214	3048	58	16		114	2

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.											
Discharges.						Deaths.				Discharges.				Deaths.				Total discharges.	Total deaths.		
White.			Black.			White.			Black.		White.		Black.		White.		Black.				
Soldiers.	Others.					Soldiers.	Others.														
M.	M.	F.	M.	F.		M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
...	117	110	60	63		2				6									350	...	
...		2	1	3		2													6	8	
...																				2	
...			1																1	...	
...	9	4	18	6					12	10									37	22	
...																				...	
1			1	3					5	3									5	8	
...																				...	
...			1																3	...	
...				1															1	...	
...						2														...	
3			1												1				1	2	
1	1		3	2							5	2							26	...	
...			1	1															12	1	
2	5	3	6	5				1	1		13		2						3	...	
...																			67	3	
...																			6	...	
9	1		1	3	1						1								17	1	
1	3		3	7							6		2						147	...	
15	7	8	26	10	2	1			2		37		5						259	7	
1																			1	...	
1	1		2								9				1				49	2	
16	8	4	13	1	3	1					8								119	5	
2			1	1	1				1	1	1								6	3	
2	1		1								1								7	...	
...																			1	...	
...													2						3	...	
1											1								5	...	
...																			1	...	
...																			3	...	
...										2							1			3	
...																	1			...	
...																	1			...	
5	3	2	6	8		1					4	2							42	...	
2	1	1		2							3								12	...	
3		1									9								32	...	
27	6	2	19	6					1		35		5						382	1	
...	1																		2	1	
...																			2	...	
...	1												1						3	...	
16	6	9	1	8					1	1	1		1						70	4	
27	35	89	19	54							24	17							313	...	
2											2		1						5	...	
878	848	1417	726	1500	15	33	22	98	119	1121	120	128	2	23	2	4	1	11224	449		

TABLE XI.—CONSOLIDATED HOSPITAL AND ASYLUM REPORT.

(A. = White Americans; F. = White foreigners; B = Black.)

	Remain- ing January 1, 1920.			Admitted.			Died.			Discharged.		
	A.	F.	B.	A.	F.	B.	A.	F.	B.	A.	F.	B.
Ancon Hospital:												
Employees.....	24	15	159	981	143	2,882	9	3	83	965	144	2,819
Army and Navy patients..	20			827			4			768		
Panama pay patients.....			1		3	12			2			1
Other pay patients.....	49	62	56	1,560	989	1,696	16	23	115	1,539	996	1,572
Charity patients.....	10	6	16	343	50	313	4	1	17	333	53	278
Total.....	103	83	232	3,711	1,185	4,908	33	27	217	3,605	1,194	4,669
Corozal Hospital (insane):												
Employees.....	1	2	15	1	1	15			2	1	1	8
Army and Navy patients..				25						24		
Panama pay patients.....	3	59	209		20	66		8	17		8	53
Other pay patients.....	2	4	16	4	5	16		1		5	7	11
Charity patients.....	1	9	63	2		15			4	1	1	17
Total.....	7	74	303	32	26	112		9	23	31	17	89
Grand total	110	157	535	3,743	1,211	5,020	33	36	240	3,636	1,211	4,758
Corozal farm (cripples):												
Employees.....		9	41		1	11					6	26
Chronic ward:												
Charity patients.....			26		1	6			2			2
Colon Hospital:												
Employees.....	2		14	289	52	698	5		30	240	30	303
Army and Navy patients..				105			6			68		
Panama pay patients.....				2	17	129		3	15	1	2	24
Other pay patients.....	12	5	7	412	316	526	11	17	47	323	193	347
Charity patients.....	2			62	9	78	1		5	55	8	54
Total.....	16	5	21	870	394	1,431	23	20	97	687	233	728
Palo Seco Leper Asylum:												
Panama pay patients.....		3	41		2	5			3			4
Charity patients.....		1	32			4			1		1	5
Total.....		4	73		2	9			4		1	9
Grand totals:												
Employees.....	27	26	229	1,271	197	3,606	14	3	115	1,206	181	3,156
Army and Navy patients..	20			957			10			860		
Panama pay patients.....	3	62	251	2	42	212		11	37	1	11	81
Other pay patients.....	63	71	79	1,976	1,310	2,238	27	41	162	1,867	1,196	1,930
Charity patients.....	13	16	137	407	60	421	5	2	30	339	63	355
Total.....	126	175	696	4,613	1,609	6,477	56	57	344	4,323	1,451	5,522

TABLE XI.—CONSOLIDATED HOSPITAL AND ASYLUM REPORT.—Continued.
(A. = White Americans; F. = White foreigners; B. = Black.)

	Trans- ferred.			Remain- ing December 31, 1920.			Average number con- stantly in hospital.			
	A.	F.	B.	A.	F.	B.	A.	F.	B.	Total.
Ancon Hospital:										
Employees.....	1	5	53	30	6	86	29.20	10.69	151.99	191.88
Army and Navy patients.....	12			63			39.01			39.01
Panama pay patients.....		2	11					10	16	26
Other pay patients.....	5	1	18	49	31	47	55.32	48.23	63.12	166.67
Charity patients.....		1	26	16	1	13	10.31	2.93	15.36	28.60
Total.....	18	9	108	158	38	146	133.84	61.95	230.63	426.42
Corozal Hospital (insane):										
Employees.....				1	2	24	.49	1.12	18.96	20.57
Army and Navy patients.....				1			2.45			2.45
Panama pay patients.....		1	5	3	62	196	3.00	60.73	188.18	251.91
Other pay patients.....				1	1	21	1.85	3.49	16.00	21.34
Charity patients.....			2	2	8	55	.39	8.44	55.06	63.89
Total.....		1	7	8	73	296	8.18	73.78	278.20	360.16
Grand total.....	18	10	115	166	111	442	142.10	136.03	509.30	787.43
Corozal farm (cripples):										
Employees.....					4	26		4.87	28.94	33.81
Chronic ward:										
Charity patients.....			3		1	25		.46	25.91	26.37
Colon Hospital:										
Employees.....	45	21	369	1	1	10	4.30	.99	11.14	16.43
Army and Navy patients.....	31						1.80			1.86
Panama pay patients.....	1	12	89			1	.01	.14	.80	.95
Other pay patients.....	84	104	129	6	7	10	8.82	5.30	11.12	25.24
Charity patients.....	6	1	17	2		2	1.53	.16	1.22	2.91
Total.....	167	138	604	9	8	23	16.52	6.59	24.28	47.39
Palo Seco Leper Asylum:										
Panama pay patients.....					5	39		4.01	39.34	43.35
Charity patients.....						30		.88	32.01	32.89
Total.....					5	69		4.89	71.35	76.24
Grand totals:										
Employees.....	46	26	422	32	13	146	33.99	17.67	211.03	262.69
Army and Navy patients.....	43			64			43.32			43.32
Panama pay patients.....	1	15	105	3	67	236	3.01	64.98	228.48	296.47
Other pay patients.....	89	105	147	56	39	78	65.99	57.02	90.24	213.25
Charity patients.....	6	2	48	20	10	125	12.23	12.87	129.56	154.66
Total.....	185	148	722	175	129	585	158.50	152.64	659.31	970.39

TABLE XII.—CONSOLIDATED DISPENSARY REPORT.

EMPLOYEES TREATED IN QUARTERS.

Place.	Re-main-ing Jan. 1, 1920.		Ad-mitted.		Died.		Dis-charged.		Trans-ferred.		Re-main-ing Dec. 31, 1920.		Days lost.		
	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	Total.
Ancon.....	3	7	1,938	1,704	.....	.....	1,907	1,660	33	43	1	8	4,468	5,331	9,799
Balboa.....	3	...	2,458	32	.....	.....	2,455	31	...	...	6	1	5,474	225	5,699
Pedro Miguel	1	1	248	135	.....	.....	241	128	8	8	...	...	742	403	1,145
Gatun.....	...	...	211	80	.....	.....	202	76	8	4	1	...	672	242	914
Cristobal....	5	26	1,257	1,297	.....	.....	1,215	1,263	38	48	9	12	3,293	7,911	11,204
Total....	12	34	6,112	3,248	.....	.....	6,020	3,158	87	103	17	21	14,649	14,112	28,761

ALL CASES TREATED BUT NOT EXCUSED.

Place.	Employees.			Nonemployees.			Total.		
	White.	Black.	Total.	White.	Black.	Total.	White.	Black.	Total.
Ancon.....	14,979	59,496	74,475	12,323	18,373	30,696	27,302	77,869	105,171
Balboa.....	52,079	18,929	71,008	50,572	14,482	65,054	102,651	33,411	136,062
Pedro Miguel...	9,774	27,270	37,044	17,664	26,749	44,413	27,438	54,019	81,457
Gatun.....	4,079	22,815	26,894	7,071	10,425	17,496	11,150	33,240	44,390
Cristobal.....	17,307	37,081	54,388	20,517	27,236	47,753	37,824	64,317	102,141
Total.....	98,218	165,591	263,809	108,147	97,265	205,412	206,365	262,856	469,221

TABLE XIII.—CONSOLIDATED ADMISSION REPORT.

	White.	Black.	Total.
Admissions to hospitals, excluding Corozal farm and chronic ward.....	6,220	6,460	12,680
Admissions of employees to quarters.....	6,112	3,248	9,360
Total admissions to hospitals and quarters.....	12,332	9,708	22,040
Less number of patients transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures.....	453	738	1,191
Net admissions to hospitals and quarters.....	11,879	8,970	20,849
EMPLOYEES.			
Employees admitted to hospitals.....	1,467	3,595	5,062
Employees admitted to quarters.....	6,112	3,248	9,360
Total admissions of employees.....	7,579	6,843	14,422
Less number transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures.....	92	441	533
Net admissions of employees.....	7,487	6,402	13,889
Annual admission rate per thousand employees to hospitals and quarters.....	1,597.05	400.50	671.84

TABLE XIV.—NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Black.	Total.
Hospitals:			
Ancon.....	41.50	170.95	212.45
Colon.....	5.29	11.14	16.43
Total.....	46.79	182.09	228.88
Quarters:			
Ancon.....	12.20	14.57	26.77
Balboa.....	14.96	.61	15.57
Pedro Miguel.....	2.03	1.10	3.13
Gatun.....	1.83	.67	2.50
Colon.....	9.00	21.61	30.61
Total.....	40.02	38.56	78.58

TABLE XV.—AVERAGE NUMBER OF DAYS IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Black.	Total.
Hospitals:			
Ancon.....	12.38	19.58	17.59
Colon.....	5.77	5.69	5.72
Total (average).....	10.85	16.91	15.17
Quarters:			
Ancon.....	2.38	3.33	2.82
Balboa.....	2.22	7.00	2.28
Pedro Miguel.....	2.87	3.10	2.95
Gatun.....	3.24	3.01	3.19
Colon.....	2.74	5.97	4.40
Total (average).....	2.44	4.44	3.13

TABLE XVI.—NUMBER OF DAYS HOSPITAL TREATMENT FURNISHED VARIOUS CLASSES OF PATIENTS.

Class.	American.	Foreign.	Black.	Total.
Ancon Hospital:				
Panama Canal employees.....	10,686	3,911	55,629	70,226
Army and Navy patients.....	14,239			14,239
Panama Government pay patients.....		36	58	94
Other pay patients.....	20,195	17,606	23,038	60,839
Charity patients.....	3,764	1,072	5,606	10,442
Total.....	48,884	22,625	84,331	155,840
Corozal Hospital (insane):				
Panama Canal employees.....	181	412	6,940	7,533
Army and Navy patients.....	893			893
Panama Government pay patients.....	1,098	22,166	68,686	91,950
Other pay patients.....	683	1,273	5,835	7,791
Charity patients.....	142	3,081	20,097	23,320
Total.....	2,997	26,932	101,558	131,487
Corozal farm (injured employees):				
Panama Canal employees.....		1,781	10,561	12,342
Chronic ward:				
Charity patients.....		169	9,457	9,626
Colon Hospital:				
Panama Canal employees.....	1,575	361	4,079	6,015
Army and Navy patients.....	679			679
Panama Government pay patients.....	5	52	295	352
Other pay patients.....	3,221	1,936	4,055	9,212
Charity patients.....	559	58	444	1,061
Total.....	6,039	2,407	8,873	17,319
Palo Seco Leper Asylum (lepers):				
Panama Government pay patients.....		1,465	14,360	15,825
Charity patients.....		324	11,682	12,006
Total.....		1,789	26,062	27,851
Grand totals.....	57,920	55,703	240,822	354,445

TABLE XVII.—WARD LABORATORY REPORTS.

	Aneon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Blood examinations (total number).....	5,656	2,124	2,917
Estivoautumnal.....	368	158	248
Tertian.....	157	69	83
Mixed, tertian, and estivoautumnal.....	17	9	.....
Quartian.....	10	2	4
Crescents.....	9	.....	.....
Spirillum of relapsing fever.....	7	6	1
White blood counts.....	2,842	560	145
Red blood counts.....	242	50	69
Differential counts.....	716	261	136
Hemoglobin estimations.....	3,804	381	794
Stool examinations (total number):.....	6,822	1,855	6,493
Ameba coli.....	47	5	12
Entameba histolytica.....	20	10	77
Uncinaria ova.....	705	105	2,096
Ascaris ova.....	376	62	895
Tricocephalus dispar.....	476	61	1,102
Bilharzia ova.....	7	.....	.....
Tinea saginata.....	7	3	6
Strongyloides.....	235	35	578
Trichuris.....	9	8	192
Ciliated monads.....	57	15	127
Balantidium coli.....	12	.....	7
Pus cells.....	257	92	918
Blood corpuscles.....	118	32	107
Pus and blood.....	93	1	119
Pus, blood and mucus.....	40	13	244
Guaiac test for occult blood.....	139	37	.....
Clonorchis sinensis.....	.....	.....	1
Urine examinations (total number).....	25,698	5,385	7,646
Acetone.....	382	362	21
Diacetic acid.....	48	.....	4
Albumin.....	5,550	1,963	1,660
Sugar.....	2,328	83	55
Bile.....	457	10	17
Guaiac test for occult blood.....	42	22	6
Indican.....	415	.....	804
Sediment.....	8,674	404	.....
Epithelial cells.....	7,600	635	462
Cylindroids.....	260	.....	240
Hyaline casts.....	2,624	317	1,051
Granular casts.....	1,838	278	927
Pus casts.....	840	206	57
Pus cells.....	8,006	1,927	1,807
Red blood corpuscles.....	1,250	468	151
Pus and blood.....	1,366	12	349
Gonococci.....	104	3	2
Tubercle bacilli.....	1	31	.....
Hemin crystals.....	14	.....	3
Functional kidney tests.....	51	1	1
Sputum (total examinations).....	3,988	1,458	1,312
Tubercle bacilli.....	340	87	243
Pneumococci.....	5	9	2
Spinal fluid.....	405	11	97
Smears of sediment.....	87	1	72
Pneumococcus.....	3	.....	8
Meningococcus.....	1	.....	2
Streptococcus.....	8	.....	.....
Staphylococcus.....	1	.....	3
Other organisms.....	11	1	2
Cell count.....	351	3	28
Ross Jones test.....	21	.....	.....

TABLE XVII.—WARD LABORATORY REPORTS.—Continued.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Smear examinations (total number).....	1,101	145	6,455
Urethral.....	850	98	251
Vaginal.....	195	12	5,579
Eyes.....	34	3	18
Nasal.....	23	4	34
Throat.....	15	12	946
Others.....	56	2	34
Pleural fluid.....			5
Flood (for malaria).....	4		
Widal reactions.....			40
Urobilin.....	12		

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Num-ber.	Died.	Num-ber.	Died.	Num-ber.	Died.
Amputations:						
Arm.....			1		1	
Forearm.....			1	1		
Hand.....	1					
Hip joint.....					2	
Thigh.....			2	2		
Leg.....	4	1	2		6	
Foot.....					2	
Digits, multiple.....	20		7		15	
Arm, double.....					1	
Operations on bones:						
Craniectomy decompressive.....	3		8	2	1	
Craniectomy, exploratory.....			2	2		
Bone transplantation, simple.....	4					
Laminectomy.....	2				1	
Ostectomy.....	4				2	
Excision of maxilla.....	1					
Resection of elbow.....					1	
Wiring of fractures, simple.....	13		1		3	
Wiring of fractures, compound.....	2		1		5	
Plating of fractures, simple.....	4					
Teeth extractions.....	11					
Adenectomy:						
Cervical.....	16				18	
Axillary.....	5				6	
Inguinal, single.....	254		5		158	
Inguinal, double.....	52		1		65	
Femoral.....	20				1	
Vaginal.....					1	
Herniotomy:						
Inguinal, single.....	128		16		104	
Inguinal, double.....	37		5		13	
Femoral.....	4		1		3	
Ventral.....	23				19	
Combined (any two of above).....					3	
Strangulated.....	4	1	4	2	1	
Genito-urinary tract:						
Nephropexy.....	4					
Cystotomy.....	3				7	
Prostatectomy.....	2	1				
Urethrotomy, internal.....	15				50	
Urethrotomy, external.....	13		2		20	
Varicocele, radical cure.....	23				15	
Hydrocele, single, radical cure.....	38		4		22	
Hydrocele, double, radical cure.....	5				13	
Orchidectomy.....	5				8	
Epididymotomy.....	73		3		19	
Vasectomy.....	9					
Amputation of scrotum.....	2				2	
Amputation of penis.....	1				1	
Amputation of penis and scrotum.....					20	
Curettage uteri.....	205		4		117	
Perineoplasty.....	17		1		43	
Nephrectomy.....	10					
Nephrotomy.....	2					
Trachelorrhaphy.....	4		1		2	
Vaginal punctures.....	4		1			
Vaginal section.....					1	
Vaginal hysterectomy.....					23	

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Num-ber.	Died.	Num-ber.	Died.	Num-ber.	Died.
Genito-urinary tract—Continued:						
Circumcision.....	291		1			
Ureterotomy.....	1					
Obstetrical:						
Caesarian section, abdominal.....	4	1	2			
High forceps.....	1					
Low forceps.....	7		6	1		
Accouchement forceps.....	3		3	1		
Version.....	1		6	1		
Perineorrhaphy.....	27				1	
Thorax:						
Excision of breast.....	2		1		2	
Thoractomy.....	8		3			
Thoracoplasty.....	1					
Rectum:						
Hemorrhoids, radical cure.....	98		5		34	
Fistula in ano, excision of.....			2		13	
Abscess, Ischio-rectae.....			1			
Resection of.....	1					
General:						
Thyroidectomy.....	8	1	1		3	
Varicose veins, excision of.....	8				4	
Tenorrhaphy.....			1		2	
Excision of surface neoplasms.....	4					
Stab wounds of soft parts, operation for.....	1	1	1			
Extensive injuries soft parts, operation for.....	1		1			
Gun shot wounds of soft parts, operation for.....					3	
Plastic operations for severe injuries.....	1	1	9	1	4	
Plastic operations for chronic peritonitis.....	1		1			
Plastic operations for congenital defects.....	3				1	
Plastic operations for effects of disease.....	7		1		4	
Skin graft.....	2		2		16	
Aneurismorrhaphy.....	1					
Enterorrhaphy.....			1			
Laparotomy:						
For general peritonitis.....	1		5	2	1	
For tubercular peritonitis.....	3					
For intestinal obstruction.....	1		2		6	1
Exploratory.....	26		1 4	1	17	
Gastro-enterostomy.....	4				4	
Entero-enterostomy.....	2	1				
Enterectomy.....			2			
Appendectomy.....	167		24	1	188	
Appendectomy with local peritonitis.....	9		24	3	2	
Appendectomy with general peritonitis.....	10	3	6		5	
Colostomy.....	1				7	
Cholecystotomy.....	3		2		4	
Cholecystostomy.....	6		1		6	
Cholecystectomy.....	4				8	
Abscess of liver, laparo-hepatotomy.....	1				2	
Abscess of liver, thoraco-hepatotomy.....	1		1			
Splenectomy.....					1	
Pan-hysterectomy.....	1		1		46	
Supravaginal hysterectomy.....	36		5	1	86	
Hysteromyomectomy.....	16		1		16	
Myomectomy.....	3		1		1	

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Num-ber.	Died.	Num-ber.	Died.	Num-ber.	Died.
Laparotomy—Continued:						
Salpingectomy, double.....	2		5	3		
Salpingectomy.....	7		4			
Salpingostomy, single.....	3		1	1	30	
Salpingostomy, double.....	4				129	
Salpingo-oophorectomy.....	18		16		164	
Ovarian cystectomy.....	10		2		17	
Oophorectomy.....	7		4		67	
Suspensio-uteri.....	71		13		88	
Ectopic gestation.....	6	1	2		2	
General peritonitis.....	2				1	
Rupture of liver.....	1					
Rupture of spleen.....					1	
Gunshot wound of abdomen.....					1	
Hematoperitoneum.....	1					
Mayo bunion operation.....	1					
Arsphenamine, intravenous.....	3,619					
Cauterization.....	228					
Minor operations, various other.....	1,579	1	168	1	806	
Major operations, various other.....	32		21	1	179	
Total.....	7,415	14	437	27	2,767	1

TABLE XIX.—REPORT SHOWING NUMBER OF OPERATIONS IN THE EYE, EAR, NOSE AND THROAT CLINIC.

ANCON HOSPITAL.

Eye:

Cataract extraction:	
Combined.....	7
Linear.....	2
Charlazon, removal.....	46
Conjunctival flap.....	1
Enucleation.....	9
Evisceration.....	1
Foreign body, removal.....	16
Hordeolum, incision.....	7
Iridectomy.....	5
Lachrymal operations:	
Dilation of ducts.....	7
Lid operations:	
Expression of lids.....	2
Plastic.....	1
Needling.....	8
Paracentesis.....	4
Pterygium.....	66
Refractions.....	1,052
Sclerotomy.....	1
Cautery of cornea.....	2

Ear:

Furuncle, incision.....	8
Foreign boy, removal.....	3
Mastoid operation:	
Simple.....	17
Radical.....	1
Paracentesis.....	66
Plastic.....	2
Polypi, removal.....	5

Nose:

Cauterization.....	4
Plastic.....	1
Polypi, removal.....	12
Rhinoplasty.....	6
Sinuses:	
Ethmoid, simple.....	10
Ethmoid, radical.....	1
Frontal, simple.....	12
Frontal, radical.....	2
Maxillary, puncture and irrigation.....	26
Sphenoid, simple.....	1
Spur, removal.....	1
Submucous resection.....	64
Tuberinectomy.....	45
Maxillary sinus, radical.....	1

Pharynx:

Adenoidectomy.....	253
Cleft palate.....	1
Peritonsillar abscess.....	32
Tonsillectomy.....	431
Uvulectomy.....	5
Plastic throat.....	1

Trachea:

Tracheotomy.....	1
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SANTO TOMAS HOSPITAL.

Eye:

Cataract extraction:—	
Simple.....	71
Combined.....	6
Chalazion, removal.....	7
Enucleation.....	6

SANTO TOMAS HOSPITAL—Continued.

Eye—Continued:	
Eviesceration.....	3
Foreign body, removal.....	28
Hordeolum, incision.....	9
Iridectomy.....	14
Paracentesis.....	2
Pterygium.....	19
Refractions.....	11
Ear:	
Furuncle, incision.....	4
Foreign body, removal.....	12
Mastoid operation:	
Simple.....	6
Radical.....	1
Polypi, removal.....	3
Nose:	
Cauterization.....	9
Foreign body, removal.....	10
Plastic.....	2
Polypi, removal.....	9
Submucous resection.....	3
Tubinectomy.....	33
Pharynx:	
Adenoidectomy.....	17
Cleft palate.....	2
Peritonsillar abscess.....	23
Tonsillectomy.....	129
Larynx:	
Foreign body, removal.....	6
Trachea:	
Tracheotomy.....	7

TABLE XX.—REPORT OF X-RAY DEPARTMENT, ANCON HOSPITAL.

Nature of examinations:	
Abdomen.....	3
Arm.....	139
Chest.....	278
Colon.....	4
Dental.....	417
Elbow.....	79
Finger.....	2
Foot and ankle.....	319
Foreign body.....	18
Gall bladder.....	70
Hand.....	221
Head.....	44
Heart.....	1
Hip.....	68
Jaw.....	67
Kidney.....	136
Knee.....	90
Leg.....	93
Liver.....	7
Pelvis.....	20
Ribs.....	43
Shoulder.....	106
Sinuses.....	108
Spine.....	84
Spleen.....	1
Stomach.....	177
Thigh.....	46
Toe.....	1
Treatment.....	52
Wrist.....	129

CLASSIFICATION OF X-RAY PLATES USED.

5 x 7.....	6
6½ x 8½.....	1,225
8 x 10.....	1,616
10 x 12.....	2,283
14 x 17.....	1,005
Dental films.....	1,533
X-ray films.....	364
Total.....	8,032

TABLE XXI.—SANTO TOMAS HOSPITAL.

PATIENTS TREATED.

Class.	Remaining Dec. 31, 1919.	Admit- ted.	Died.	Dis- charged.	Remaining Dec. 31, 1920.
Pay cases.....	15	980	36	931	28
Charity cases.....	397	8,472	778	7,748	343
Total.....	412	9,452	814	8,679	371

Class.	Number treated.	American.		Other nations.	
		White.	Black.	White.	Black.
Pay cases.....	1,307	27	.....	526	754
Charity cases.....	13,277	28	.....	1,530	11,779
Total.....	14,584	55	.....	2,056	12,533

Number of days relief furnished patients.....	155,593
Average number of patients constantly sick.....	422
Average number of days treatment for each patient admitted.....	10
Cost of subsistence per patient per day.....	\$0.371
Cost of hospitalization per patient per day.....	\$1.515

DISPENSARY REPORT.

Class.	White.	Black.	Total.
Natives treated.....	16	6,060	6,076
Foreigners treated.....	149	2,605	2,764
Total.....	165	8,665	8,840

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Dis- charged.	Died.
Typhoid fever.....	2	1
Malaria.....	201	3
Malarial fever, estivoautumnal.....	146	5
Malarial fever, tertian.....	5	
Smallpox.....	5	
Measles.....	119	
Scarlet fever.....	1	
Whooping cough.....	4	
Diphtheria and croup.....	79	4
Influenza.....	367	17
Dysentery.....	56	2
Dysentery, entamebic.....	2	1
Leprosy.....	4	
Erysipelas.....	11	
Dengue.....	3	
Chicken pox.....	72	
Mumps.....	1	
Purulent infection and septicemia.....	35	11
Anthrax.....	3	1
Tetanus.....	2	2
Pellagra.....	3	3
Beriberi.....	2	
Tuberculosis of the lungs.....	80	170
Acute miliary tuberculosis.....	2	1
Abdominal tuberculosis.....	2	
Pott's disease.....	2	1
Tuberculosis of bones and joints.....	1	
Tuberculosis of other organs.....	16	5
Tuberculosis of the lymph glands.....	2	
Disseminated tuberculosis.....	2	3
Rickets.....	1	
Syphilis, primary.....	370	21
Syphilis, tertiary.....	74	12
Gonococcus infection.....	604	3
Gonorrhea.....	120	1
Gonorrheal arthritis.....	108	
Gonorrheal bubo.....	20	
Soft chancre.....	121	1
Adenitis chancroidal.....	32	
Cancer and other malignant tumors of the buccal cavity.....	8	3
Cancer and other malignant tumors of the stomach, liver, esophagus, and pharynx.....	4	2
Cancer and other malignant tumors of the peritoneum, intestines, rectum..	5	2
Cancer and other malignant tumors of the female genital organs.....	7	4
Cancer and other malignant tumors of the breast.....	6	
Cancer and other malignant tumors of the skin.....	2	
Cancer and other malignant tumors of other organs and of organs not speci- fied.....	8	4
Other tumors.....	14	4
Acute articular rheumatism.....	12	
Chronic rheumatism and gout.....	14	
Gout.....	2	
Diabetes.....	2	1
Addison's disease.....	1	
Leukemia.....	1	
Anemia, chlorosis.....	5	1
Other general diseases.....	24	1
Alcoholism.....	54	1
Drug habit.....	2	
Encephalitis.....	1	
Simple meningitis.....	3	11
Locomotor ataxia.....	1	1
Other diseases of the spinal cord.....	1	
Acute anterior poliomyelitis.....		7
Cerebral hemorrhage, apoplexy.....	5	5

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Dis- charged.	Died.
Softening of the brain.....	1	1
Paralysis without specified cause.....	17	4
Other forms of mental alienation.....	18	1
Epilepsy.....	33	1
Convulsions of infants.....	4	1
Hysteria.....	8	1
Neuritis.....	14	2
Other diseases of the nervous system.....	1	1
Neurasthenia.....	111	1
Diseases of the eyes and their annexa.....	10	2
Cornea.....	15	2
Diseases of the ears.....	4	3
Otitis media.....	3	3
Pericarditis.....	3	4
Acute endocarditis.....	33	24
Organic diseases of the heart.....	1	1
Angina pectoris.....	30	12
Diseases of the arteries, atheroma, etc.....	6	1
Arteriosclerosis.....	34	1
Embolism and thrombosis.....	21	1
Diseases of the veins.....	87	1
Hemorrhoids.....	1	4
Diseases of the lymphatic system.....	32	1
Lymphadenitis.....	3	1
Hemorrhage.....	3	1
Diseases of the nasal fossae.....	1	4
Diseases of the larynx.....	32	6
Laryngitis.....	46	25
Diseases of the thyroid body.....	20	20
Acute bronchitis.....	40	26
Chronic bronchitis.....	24	2
Broncho-pneumonia.....	2	2
Pneumonia, unqualified.....	2	2
Lobar pneumonia.....	16	5
Pleurisy.....	1	1
Empyema.....	2	1
Gangrene of the lungs.....	2	1
Asthma.....	1	2
Other diseases of the respiratory system.....	115	2
Hay fever.....	36	1
Diseases of the mouth and annexa.....	5	9
Diseases of the teeth and gums.....	47	3
Diseases of the pharynx.....	3	4
Follicular tonsillitis.....	29	24
Ulcer of the stomach.....	21	6
Other diseases of the stomach.....	28	13
Gastrectasis.....	4	1
Acute gastritis.....	135	2
Diarrhea and enteritis (under 2 years).....	254	3
Colitis (under 2 years).....	2	3
Diarrhea and enteritis (2 years and over).....	108	3
Colitis (2 years and over).....	11	1
Ankylostomiasis.....	5	1
Intestinal parasites.....	144	8
Strongyloidosis.....	59	1
Appendicitis and typhlitis.....	14	4
Acute appendicitis.....	10	4
Chronic appendicitis.....	5	1
Hernia, intestinal obstructions.....	16	6
Constipation.....	2	1
Duodenal ulcer.....	1	1
Cirrhosis of the liver.....	1	1
Biliary calculi.....	1	1
Other diseases of the liver.....	1	1
Abscess of liver (unqualified).....	1	1

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Dis- charged.	Died.
Abscess of the liver, entamebic.....	.....	2
Cholecystitis.....	5	.....
Diseases of the spleen.....	13	1
Simple peritonitis, nonpuerperal.....	4	6
Other diseases of the digestive system.....	6	.....
Acute nephritis.....	3	7
Bright's disease.....	157	77
Other diseases of the kidney and annexa.....	6	3
Pyelo-nephrosis.....	1	1
Calculi of the urinary passages.....	3	.....
Diseases of the bladder.....	32	4
Cystitis.....	4	1
Diseases of the urethra, urinary abscess, etc.....	52	.....
Stricture of the urethra, nonvenereal.....	44	.....
Vesico-vaginal fistula.....	1	.....
Diseases of the prostate.....	3	.....
Nonvenereal diseases of the male genital organs.....	46	1
Hydrocele.....	12	1
Uterine hemorrhage, nonpuerperal.....	3	.....
Uterine tumor, noncancerous.....	42	2
Other diseases of the uterus.....	23	1
Metritis.....	137	1
Cysts and other tumors of the ovary.....	20	1
Salpingitis and other diseases of the female genital organs.....	203	3
Nonpuerperal diseases of the breast, cancer excepted.....	4	.....
Normal labor.....	840	.....
Accidents to pregnancy.....	157	3
Puerperal hemorrhage.....	1	3
Other accidents of labor.....	8	1
Puerperal septicemia.....	.....	1
Puerperal albuminuria and convulsions.....	3	.....
Eclampsia.....	1	.....
Following childbirth, not otherwise defined.....	4	.....
Puerperal diseases of the breast.....	1	.....
Gangrene.....	1	1
Furuncle.....	14	1
Acute abscess.....	101	1
Phlegmon and cellulitis.....	5	.....
Scabies.....	30	.....
Elephantiasis.....	2	.....
Ulcer of the skin.....	175	1
Other diseases of the skin and annexa.....	58	.....
Diseases of the bones, tuberculosis excepted.....	56	.....
Periostitis.....	1	.....
Diseases of the joints, tuberculosis and rheumatism excepted.....	19	.....
Arthritis.....	1	.....
Amputations.....	2	.....
Other diseases of the organs of locomotion.....	11	1
Congenital malformations.....	49	.....
Newborn child.....	705	.....
Icterus and sclerema.....	87	109
Other causes peculiar to early infancy, including various consequences of labor.....	.....	1
Senility.....	29	.....
Suicides.....	.....	1
Poisoning by food.....	2	1
Other acute poisonings.....	5	1
Burns, conflagration excepted.....	33	3
Traumatism by firearms.....	22	2
Traumatism by cutting or piercing instruments.....	86	2
Traumatism by fall.....	61	3
Traumatism by machines.....	10	.....
Traumatism by other crushings.....	41	2
Traumatism by landslides.....	1	.....
Injuries by animals.....	10	.....

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Dis- charged.	Died.
Lightning.....	1	.....
Electricity, lightning excepted.....	1	2
Homicide by firearms.....	.....	2
Fractures, cause not specified.....	34	3
Sprains.....	22	1
Other external violence.....	78	.....
Cause of death not specified or ill-defined.....	2	1
Infections of undetermined origin.....	5	.....
No disease.....	36	.....
Feigned disease.....	138	.....

TABLE XXII.—COROZAL HOSPITAL—STATEMENT OF COMMITMENTS AND DISCHARGES.

COMMITMENTS.

	Male.	Female.
From Canal Zone:		
First admission.....	62	19
Second admission.....	1	2
From Panama Government:		
First admission.....	46	31
Second admission.....	7	2
Totals.....	116	54

DISCHARGES.

	Well.		Improved.		Unimproved.	
	Male.	Female.	Male.	Female.	Male.	Female.
Antigua.....	1		1			
Barbados.....	3	6	7	6	1	3
Bolivia.....						1
Chile.....	1					
Colombia.....	1		2			1
England.....					1	
France.....			1			
Granada.....			2			
Jamaica.....	3	3	6	8	2	2
Martinique.....		1		2	1	
Nicaragua.....					1	
Porto Rico.....	1					
Panama.....	12	4	6	5	4	2
Peru.....			1			
Spain.....	1					1
St. Lucia.....			1	1		
United States.....	8		12		11	
Venezuela.....	1					
Trinidad.....	2		1			
Turk's Island.....			1			
Sweden.....	1					
Russia.....					1	
Totals.....	35	15	41	22	22	10

TABLE XXIII.—CONTAGIOUS AND INFECTIOUS DISEASES.

Reported during the year 1920.

	Pana- ma.	Colon.	Canal Zone.	Non- resident.	Total.
Acute contagious conjunctivitis (pink eye)		4			4
Chicken pox	79	24	105	9	217
Diphtheria	95	37	37	3	172
Dysentery	41	16	11	36	104
German measles		1			1
Erysipelas	9	3	1	6	19
Favus	1				1
Hookworm		2	1		3
Influenza	313	482	473	46	1,314
Relapsing fever	1		3	5	9
Leprosy	4		3	2	9
Malaria	100	41	¹³ 728	352	1,221
Measles	154	89	103	8	354
Meningitis, tuberculous	3	1	3	2	9
Mumps	21	15	73	3	112
Ophthalmia neonatorum	1	3			4
Para-typhoid	1			1	2
Pellagra	5	3	1	2	11
Pneumonia	175	56	34	40	305
Acute anterior poliomyelitis	6		1	2	9
Scarlet fever	4	5	3	1	13
Septic sore throat			1		1
Smallpox	14			11	25
Tetanus	5	1		1	7
Tuberculosis	311	121	70	105	607
Typhoid fever	8	9	2	17	36
Whooping cough	4	69	70		143

¹³ 576 cases sanitated area, 117 cases cattle camps and plantations, 35 miscellaneous unsanitated areas.

TABLE XXIV.—FORCE REPORT.

	December 31, 1920.			1919.	1918.
	Gold.	Silver.	Total.		
Chief health office	3		3	3	4
Medical storehouse	4	4	8	8	9
Quarantine service	11	33	44	47	48
Health office, Panama	12	109	121	164	158
Health office, Colon	14	145	159	173	155
Ancon Hospital	134	226	360	368	338
Colon Hospital	25	35	60	55	50
Santo Tomas Hospital	7		7	6	6
Palo Seco Leper Asylum	2	48	50	40	34
Zone sanitation	5	138	143	223	168
Corozal Hospital and farm	16	82	98	113	114
Dispensaries	11	8	19	16	25
Total	244	828	1,072	1,216	1,109

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